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The Relationship of Written and Oral Language in Children Age Nine, Ten, Eleven

University — Université

U of A, Edmonton

Degree for which thesis was presented — Grade pour lequel cette thèse fut présentée

M Ed.

Year this degree conferred — Année d'obtention de ce grade	Name of Supervisor — Nom du directeur de thèse
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THE UNIVERSITY OF ALBERTA

THE RELATIONSHIP OF WRITTEN AND ORAL LANGUAGE IN CHILDREN AGE NINE, TEN, ELEVEN

by

© D. BRUCE CAMERON

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF EDUCATION

DEPARTMENT OF ELEMENTARY EDUCATION

EDMONTON, ALBERTA

FALL, 1979

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled The Relationship of Written and Oral Language in Children Ages Nine, Ten, Eleven submitted by D. Bruce Cameron in partial fulfilment of the requirements for the degree of Master of Education.

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Date ..... September 25 1979

ABSTRACT

At present, a limited understanding exists of how written language develops in children at the upper elementary grades and of how their oral and written language are interrelated. Most of the research into these areas has focused on syntax and given scant attention to the role of meaning and to linguistic factors beyond the sentence or T-unit level. The studies have also seldom specified the theoretical bases for the descriptive language measures which they have employed.

An attempt was made in the present study to address these shortcomings through a more refined system of analysis based on the Semantic Potential Theory of Language (Fagan, 1978). This theory considers language to contain denotational, relational, sentential, and contextual categories of information. These four categories of information are conveyed by a variety of syntactic structures which form a fifth category of syntactic information. In the case of written language, the Theory would hold that the reader makes use of these forms of information in the construction of meaning.

The study's experimental design was a three by two factorial (age by sex). One hundred and eight children made up the sample with eighteen girls and eighteen boys chosen at each of ages nine, ten, and eleven. Each child viewed one of two films and was then asked to give a written and an oral recall of the film. The instrument of language analysis was used to examine the children's written language and then to compare their written with their oral language which had previously been analyzed by Fagan (1978).

The study found that the use of a number of categories and sub-categories of information in written language developed over ages nine, ten, and eleven. The eleven year old children tended to make greater use of syntactic structures which expressed information economically than did the younger children. Certain types of information were more employed by girls than by boys. The organizational pattern for topics changed over age and appeared to reflect more awareness of the reader on the part of the older students. Reading achievement and socio-economic status were correlated to a greater degree with written language than were I.Q. scores.

In comparison with oral language, written language contained greater amounts of most of the types of information studied. The differences which occurred between oral and written language were generally magnified with increasing age.

The findings of the present study suggest that when providing written language instruction, teachers should be aware of how children's written language develops and increasingly differentiates itself from their oral language. Students should be encouraged to think of the information needs of their potential readers. In assessing written language, teachers should bear in mind such factors as mode of discourse, purpose for writing, subject matter, and method of presentation.

The Semantic Potential Theory of Language was felt to have merit as a theoretical framework for analyzing children's written language development and comparing it with their oral language development. Future research examining those variables for which the greatest growth and differences were found could lead to further refining of this theory.

ACKNOWLEDGEMENTS

For their help in the carrying out of this study, I would like to sincerely thank the following:

The children who so willingly provided the data for the study.

The staff and administrators for their aid in facilitating the collection of the data.

My advisor, Dr. William Fagan, for his invaluable guidance and encouragement throughout the course of the investigation.

Dr. Jean Robertson and Dr. Carol Yewchuk for their thorough and thoughtful examination of the study and their insightful comments and suggestions.

El Souch, Balfour Gallivan, and Peter Little for their aid in the analysis of the data.

Stuart Adams for his assistance in the data analysis and for the camaraderie which made the entire task lighter than what might otherwise have been the case.

Joan Benson and Sheila Myers for converting my handwriting into typed drafts.

Margaret Voice for the speed and consummate skill with which the final copy was typed.

My father for his extremely helpful support and advice.

Pat and, of late, Kent for the sacrifices made in order to provide me with the many hours needed to conduct the study.

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CHAPTER I

INTRODUCTION

I. INTRODUCTION AND TOPIC

A number of major investigations (Hunt, 1965; O'Donnell, Griffin, and Norris, 1967; Britton, 1975; Loban, 1976) attest to the fact that research and interest in children's written language development has accelerated within recent years. This is partially a result of an increased awareness of structural, transformational-generative, and other schools of linguistic thought which have provided alternative ways of describing language to that supplied by traditional grammar.

Another factor which may influence the expansion of research in the future is the mounting concern for "accountability" in education, as evidenced by the addition of writing to the National Assessment of Educational Progress in the United States. The initial assessment of writing was conducted in 1969-70 and one of the findings from the second assessment held in 1973-74 was an apparent decline in the quality of the average essay written by thirteen and seventeen year old students (Mullis, 1976).

These and similar research and evaluation efforts are revealing the complex nature of writing and how limited our understanding is of the process and product involved. For example, Britton and others (1975) set up eleven 'sense of audience' and fifteen 'function' categories as representing two possible dimensions of a multi-dimensional model of written language. They then detailed how the writing of

students varied on these two dimensions over ages eleven to eighteen across five different subject areas. The variations they found pointed to a need for teachers of most subjects to bear some responsibility for the teaching of writing within their areas.

The major studies mentioned at the outset, in addition to many others, furnish evidence that students' written language continues to grow in complexity throughout the school years. However, even with the recent rise of interest in writing, written language as an expressive skill generally receives a great deal less attention within school curricula and research literature than does its receptive counterpart, reading. Our lack of knowledge about the creative processes involved in writing and their relationship to the final product often makes teaching and evaluation difficult. This has frequently led to a lack of stress on the teaching and practice of written discourse. Placement of instructional emphasis may instead be in the more tangible area of formal grammar despite numerous research findings of lack of transfer from instruction in grammar to writing skills (Moffett and Wagner, 1976).

While some linguists such as Vachek (1972) propose that written language is basically an autonomous language system from oral language, the majority would agree with Gleason's statement that "the relationships between speech and writing are close and intimate" (1961, p. 408). Although many similarities exist between the written and oral expression of thought, there is a growing awareness of the number of dissimilarities involved. The amenability of written language to revision; its greater dependence on syntactic clues for meaning; and

its lack of audience interaction relative to oral language are a few examples of such differences. There have been some studies done on the relationship between children's written and oral language (Riling, 1965; Harrell, 1957; O'Donnell, Griffin, and Norris, 1967; Loban, 1976) but, overall, there is a substantial dearth of research in this area.

The topic to be addressed in the present study was a description of the written language used by children who are nine, ten, and eleven years of age. This study was one of three companion studies which each utilized the same form of language description. The first investigation (Fagan, 1978) involved an analysis of the oral language of children of ages nine, ten, and eleven. As the second in the series, the present study examined the written language in these same children and, in addition, compared their written language with their oral language in the first study. The third investigation (Adams, 1979) consisted of a study of the written language in fourth, fifth, and sixth grade basal readers and included a comparison of the authors' language to the children's oral and written language described in the first two studies.

II. THE PROBLEM

Research into children's written language development prior to Hunt (1965) relied heavily on measuring growth by mean sentence length and by average amounts of elements such as clauses and parts of speech found within sentences. However, the use of run-on sentences and limited mastery of the mechanics of punctuation and capitalization, particularly in the elementary grades, made the decision as to what

constituted a sentence an often highly subjective one.

Hunt's use of the T-unit consisting of a main clause and any subordinate clauses connected to it, provided a much more objective and reliable unit for language division. His study and a number of subsequent ones involving children's written language (O'Donnell, Griffin, and Norris, 1967; Perron, 1976) found significant increases over progressive grade levels in the mean length of T-units.

To date, the majority of studies of written language development in children have focused on the measurement of syntactic elements within sentence or T-unit divisions. Transformational-generative grammar has had considerable influence on such studies since the 1960's. The transformationalists working basically within a sentence model were primarily interested in syntax and gave little emphasis to semantics. However, since the emergence of the generative-semanticists in the late 1960's there has been a noticeable trend in linguistic circles to examine the role of meaning not only at the sentence level but also at a discourse level.

The theoretical basis for the language description utilized in the present study stems from this latter development. Known as the Semantic Potential Theory of Language, it is described in detail in the second chapter of Fagan's study (1978). This theory sees no need to posit a deep structure component nor transformations to link such a component to surface structure. Instead, it views the surface structure as containing not meaning but rather the potential for meaning. The potential exists in the form of denotational, relational, sentential, contextual, and syntactical types of information which the reader, in

the case of written language, may use in the construction of meaning. These categories formed the basis for the construction of the descriptive instrument used in this study and the two companion studies.

Three main purposes governed the present study. The first was to describe the written language of children nine, ten, and eleven years of age with some consideration being given to semantics and to discourse beyond the sentence level. The second was to generate empirical data which might aid in testing the value of the descriptive instrument and the theory underlying it. The third and final objective, was an examination of the relationship between children's written and oral language.

III. DEFINITION OF TERMS

The terminology used in this study's language analysis is defined and illustrated in Appendices A and B. This section provides a definition of terms used in the hypotheses.

T-unit consists of a main clause and the subordinate clauses, if any, attached to it. T-unit and utterance are synonymous terms since the T-unit formed the basis upon which the language protocols were divided into utterances.

Basic T-unit is one in which the least number of lexical items required to form a T-unit are present. This would be a main clause which may involve only a subject and verb, or a verb by itself in the case of an imperative sentence.

Incomplete T-unit is composed of a group of lexical items which lacks one of the components required to form a basic T-unit. It may

be missing a subject, verb, necessary object, complement, or any combination of these.

Maze involves a word or a group of words which are not an integral part of the language sequence. They frequently are a result of inadvertent repetition on the writer's part.

Denotational Information consists of information relating to lexical items and includes nouns, verbs, adjectives, adverbs, verbals, determiners, quantifiers, negatives, intensifiers, modals, prepositions, conjunctions, and expletives. Clauses and phrases are also forms of denotational information since they provide information about nouns and verbs.

Relational Information is information about the relationships that may exist among the lexical items. The verb is the focal point of a T-unit and around the verb such other relationships as subject, direct object, indirect object, and complement may occur.

Contextual Information concerns information that extends across the boundaries of the sentence and T-unit. It is comprised of three subcategories. Referential includes words that refer to another noun/pronoun or idea previously mentioned. Examples of referential connectives are pronouns, repetition of lexical items, synonyms, class inclusion, derivation, inclusion, and formal repetition. Logical connectives furnish information on the nature of the relationships between topics. The specific relations noted are condition, conjunction, disjunction, temporal conjunction, temporal disjunction, contrast,

comparison, and spatial relations. The final subcategory involves topics and order. A topic is that information which generally occurs to the left of the verb and is about something (ships, books, etc.). Topics are introduced in a sequence (order) and may be grouped in varying ways. For example, one writer may produce eight instances of an initial topic before introducing a second topic, while another writer may intersperse instances of the first topic among the introduction of subsequent topics.

Syntactic Information refers to a string of words which are used to convey different kinds of information. The largest syntactic string used in this study was the T-unit. Within a T-unit there is a basic T-unit and possibly other syntactic structures which are alternates to basic T-units. By the rearrangement or addition of items to these alternate syntactic patterns they could be made into basic T-units. In the sentence "He got sent to the captain who was his dad," the basic T-unit is "He got sent to the captain." The additional syntactic pattern "who was his dad" can be converted to a basic T-unit by substituting the captain for who. These alternate syntactic structures are designated by various names. Names and examples for these structures are in Appendix B.

Reading Achievement is the raw score obtained on the Paragraph Meaning subtest of the Stanford Reading Achievement Test, Primary II, Intermediate I, Intermediate II for the nine, ten, and eleven year olds, respectively.

I.Q. Score is the score from the Verbal Battery of the Canadian Lorge-Thorndike Intelligence Test, Form 1, Level A for the ten and eleven year olds, and the Verbal Battery of the Canadian Cognitive Test of Abilities, Form 1, Level A for the nine year olds.

Socio-Economic Status refers to the occupation of the parents. If both parents were working, the child was ranked according to the occupation with the higher rating. The California Socio-Economic Scale of Urban Occupations which has a five-point scale was used to classify the occupations.

IV. HYPOTHESES

Investigation of the following null hypotheses was carried out:

1. (a) There will be no significant differences in the number of words per T-unit over age levels nine, ten, and eleven.
   (b) There will be no significant differences over age levels nine, ten, and eleven in the number of (i) incomplete T-units, (ii) mazes per T-unit.
2. There will be no significant differences over age levels nine, ten, and eleven in the amounts of the following information per T-unit:
   (a) denotational information
   (b) relational information
   (c) contextual information, consisting of (i) topics and ordering, (ii) referential information, (iii) logical information.

3. There will be no significant differences over age levels nine, ten, and eleven for:
   (a) number of basic T-units
   (b) number of alternate syntactic structures per T-unit
   (c) number of (i) words and (ii) denotational information per syntactic structure.
4. There will be no significant differences between boys and girls for:
   (a) number of words per T-unit, incompletes, mazes per T-unit
   (b) amount of denotational information per T-unit
   (c) amount of relational information per T-unit
   (d) amount of contextual information per T-unit
   (e) amount of syntactic information per T-unit.
5. There will be no significant relationship between:
   (a) reading achievement
   (b) I.Q. scores
   (c) socio-economic status
   and
   (i) denotational information
   (ii) relational information
   (iii) contextual information
   (iv) syntactic information.
6. There will be no significant differences between children's written and oral language over ages nine, ten, and eleven for:
   (a) number of words per T-unit, incompletes, mazes per T-unit
   (b) amount of denotational information per T-unit

(c) amount of relational information per T-unit

(d) amount of contextual information per T-unit, consisting of

(i) topics and ordering, (ii) referential information,

(iii) logical information

(e) amount of syntactic information per T-unit.

V. SIGNIFICANCE OF THE STUDY

In view of current inadequacies in studies of children's written language development in the upper elementary grades (ages nine, ten, eleven), this investigator considered that the present study using a descriptive instrument based on the Semantic Potential Theory of Language would have the following advantages:

1. The obtaining of information to broaden the knowledge base available on children's written language development.

2. Using a method of analysis which takes some account of semantic factors within and beyond the sentence level.

3. Gathering data which might aid in the testing and further development of applications of the Semantic Potential Theory of Language.

4. Discerning possible relationships of written language factors to sex, reading achievement, IQ, and socio-economic status.

5. Identifying information which might provide further insights for teachers of writing in grades four, five, and six.

6. Secondarily, comparing children's oral and written language to determine similarities and differences which exist between them.

VI. OVERVIEW

As part of a broader investigation of language, the present study should be considered within the context of the total project. An outline of certain facets of the overall project and some specifics of the present study are set forth in this section.

1. The Language Research Project is composed of three interrelated studies. In Part I of the project, Fagan (1978) developed the Semantic Potential Theory of Language which provided the theoretical rationale for the language analysis measures used in the project. This theory is largely based upon the Surface Generalization Theory of Language which is the result of work done by Prideaux (1975) and colleagues from the Department of Linguistics at the University of Alberta. Fagan then used these language analysis measures to describe the oral language performance of 108 nine, ten, and eleven year old children from four Edmonton public schools.

Part II of the project used the same language measures to describe the written language performance of these same children. These results were then compared with those found in Part I.

Adams (1979) in Part III of the project, again used the same language analysis measures to study the language of authors in fourth, fifth, and sixth grade basal readers. He then compared his findings with those found in Parts I and II.

2. The Present Study is set out in the following manner. Chapter II provides a review of the related literature. This includes a summary of research on written language development. Chapter III gives the design of the study and contains a short summary of the

Semantic Potential Theory of Language. The detailed description of the theory is available in Fagan (1978), Chapter II. In Chapter IV the findings on written language development are presented. Chapter V gives the results from the comparison of written and oral language. Finally, Chapter VI sets forth a summary of findings, presents the conclusions, and draws implications for further research.

CHAPTER II

REVIEW OF LITERATURE

This chapter provides a survey of research studies available on children's written language development. It is divided into two main sections. The first involves research which examined written language and the second contains studies which compared oral and written language development. A major criterion adopted in selecting these studies for review was their relevance to the age levels (nine, ten, and eleven) under consideration in the present study.

I. WRITTEN LANGUAGE DEVELOPMENT STUDIES

The majority of written language development studies have been primarily concerned with the measurement of syntactic factors. This work was carried out within a framework of traditional grammar until the 1960's when studies influenced by structural and transformational-generative grammar began to appear. The remainder of this first section is devoted to a consideration of the traditional studies followed by a look at those investigations which make some use of other linguistic approaches. Studies, in the main, will be treated in approximate chronological order.

1. Traditional Studies

Stormzand and O'Shea (1924) conducted one of the early major studies in an attempt to determine if the teaching of grammar as set out by textbooks of the day was adequate. They analyzed ten

thousand sentences from a variety of sources that included both children's and authors' writing. A thousand of these sentences were taken from compositions written by fourth, sixth, seventh, and eighth grade students. On the basis of their findings on usage and correctness, recommendations were made for a wholesale revision of grammar textbooks.

With the exception of clause length, Stormzand and O'Shea included in their analysis, all of the measurements which were to become, as Hunt (1976, p. 1) termed it, the 'standard procedure' in written language development studies. These measurements were sentence length; a ratio indicating degree of subordination; frequency of noun, adjective, and adverb clauses; and a breakdown of adverbial clauses on the basis of meaning (time, place, etc.).

They used the number of dependent clauses per sentence for their subordination ratio and found that this ratio increased gradually from grade four to grade six and on into adulthood. A progressive lengthening of sentences was also noted for this same period. However, their clause measurement findings between grades four and six were quite inconsistent with development noted at the seventh grade and beyond. For example, they found that noun clauses made up 38.9% of all clauses at the fourth grade, 9.6% at the sixth grade, and 18% at the seventh grade. Stormzand and O'Shea felt that this result might be due to the "limited amount of material examined" for the fourth grade (p. 39).

The failure to specify the number of students and the exact amount of written material studied at individual grade levels made it

difficult to weigh the validity of their findings. These findings were mainly based on ratios of occurrence within sentences, but no definition of what constituted a sentence, a reoccurring problem in research to follow, was provided. Stormzand and O'Shea did indicate that there was considerable variation in the topics which were assigned at different grade levels. A number of their findings, they believed were affected by this variation in subject matter, e.g., tense usage, classes of pronouns. Despite its flaws, this study was noteworthy for the comprehensive analysis it undertook and the establishment of a base upon which many future studies were built.

Hoppes (1933) examined over fifteen thousand sentences written on a variety of topics by three hundred and eighty-six students in grades three through six. Searching for signs of sentence development, he found across the grades that proportional to the total number of sentences, there was a decline in the percentage of simple sentences and an increase in the percentage of complex and compound-complex sentences. To further illustrate this extended use of subordination with increase in grade level, Hoppes used a ratio in which the number of coordinate clauses were divided by the number of subordinate clauses. This ratio decreased across grades three to six.

The validity of the above findings was somewhat questioned by Hoppes' failure to provide a definition of a sentence. In looking at the data, he had discovered a high percentage of sentence construction errors such as run-on sentences and failure to use periods and capitals. For example, twenty-nine percent of all sentences written by fifth grade boys were improperly constructed. This suggests that

subjective decisions played a large role in the determination of sentence boundaries throughout the analysis.

A similar classification of types of sentences was carried out by Bear (1939) who examined approximately twelve thousand stories written by students in grades one to eight on the topic of an interesting summer experience. She reported an increasing use of compound and complex sentences throughout these grades, with complex sentences accounting for most of the growth. A considerable number of run-on sentences were also noted, e.g., 14.8% of sentences written by grade five boys.

The lack of skill which elementary school children exhibited in sentence punctuation led Seegars (1933) to criticize the use of the sentence as a "unit on the basis of which comparisons can be made and relationships computed" (p. 51). He suggested that a ratio of the number of dependent to the number of independent clauses would make a better measure. In his investigation, this ratio was used to examine six hundred and four compositions written at grades four, five, and six. These compositions were representative of three categories of discourse: argumentation, exposition, and narration/description. The results of this analysis indicated that the ratio of dependent to independent clauses dropped among the three types of discourse in the order just stated. Seegars cautioned researchers to be aware of the possible effects of mode of discourse on sentence structure in written language, an admonition often ignored in future investigations.

Probably the most influential study of the 1930's was conducted

by LaBrant (1933). As part of a larger investigation which also involved high school and adult writing, she examined the usage of independent and dependent clauses by four hundred and eighty-two children in grades four to nine. These children were required to write within a twenty minute period on the theme of whether summer vacations are wasteful. A key measure in the study was the 'subordination index' consisting of the number of dependent predicates divided by the total number of predicates. When the subordination index was calculated for each student from grades four to nine, it was found to correlate with chronological age ($r = .41$) and to a lesser extent with mental age ($r = .29$). The correlation between chronological age and the subordination index led LaBrant to speculate that experience might be "a considerable factor in modifying language skill" (p. 425).

Frogner (1933) studied nearly three thousand compositions written by almost a thousand students in grades seven, nine, and eleven and found that fewer simple sentences and more sentences with dependent clauses were used over these grade levels, particularly between the ninth and eleventh grade. She obtained a correlation of -.02 between I.Q.'s at these grade levels and sentences with dependent clauses leading her to conclude that maturity and not I.Q. was the most important factor in the increased use of such sentences.

A well known study by Heider and Heider (1940) compared the sentence structures used by deaf and hearing children. All children viewed a short film twice and then wrote basically narrative accounts of what they had seen. The results reported here are those which were

found for the eight hundred and seventeen hearing children who ranged in age from eight to fourteen. Composition length and the average number of words per sentence were both found to increase with age. As noted in earlier research, there was a decline in simple sentences and an increase in compound, complex, and compound-complex sentences over successive age groups. However, the Heiders found almost the reverse proportions of complex to compound sentences that had been obtained in a number of previous studies. A comparison at the age eleven or grade six level illustrates the magnitude of the difference:

	Heider and Heider (1940)	Bear (1939)	Stormzand and O'Shea (1924)
	Age 11	Grade 6	Grade 6
Compound Sentences	38%	8.1%	5.5%
Complex Sentences	13%	33.5%	36.5%

The Heiders felt that this was a result of the organization provided for the compositions by the film's straightforward sequencing of events. Quoting Seegars' (1933) research, Heider and Heider argued that the difference in composition topics across studies allowed one to search for developmental trends but not for absolute values of particular elements. So while they obtained much smaller values using the subordination index than LaBrant (1933) did for comparable ages, they did find that the index increased over age.

A similar example occurred in the Heiders' and the LaBrant's findings on the frequency of occurrence of subordinate clause types. Both they and LaBrant (1933) found that adverb clauses were the most

common followed by noun and then adjective clauses. The Heiders, though, reported a considerably larger percentage of noun clauses than LaBrant, explaining that this was because their children had probably written more indirect discourse.

In an English study, Watts (1944) found a similar order of clause usage, although, he erroneously stated that LaBrant (1933) had "shown that noun clauses were among the clauses least used" (p. 123). Watts had several hundred children (the exact number was not specified) ranging in age from seven to fifteen write on the subjects Father Keeps House and A Day when Everything went Wrong. He found that the percentage of dependent clauses to total clauses (LaBrant's subordination index) increased across these ages, but did not believe, as LaBrant did, that this finding was more related to chronological than mental age. This belief was based on the fact that Watts found it simple to determine "the brighter children at the lower age-levels by their greater skill in their management of the different types of dependent clauses" (p. 123).

Watts determined that the average number of different kinds of dependent clauses rose at each age level and that girls consistently had higher averages than boys of the same age. He felt that this gave a better measure of writing progress than the subordination index which could, in some instances, reflect the repeated use of only a single type of dependent clause. Noting that increases in the percentage of dependent clauses were smaller at higher age levels, Watts suggested that this was due to the "use by older children of prepositional phrases and infinitive expressions as alternatives to dependent

clauses" (p. 124).

Some confirmation of this point of view was provided by Biscoe (1951) who carried out an investigation with five hundred and forty-three students in grades four to eight. At higher mental age levels, finite verbs were used less in independent clauses and more in dependent clauses and there was a greater incidence of non-finite verbs and prepositional phrases. Biscoe also found that the mean number of different kinds of phrases and clauses combined increased across mental age.

A somewhat unnatural and highly prescriptive assignment was used to obtain written language samples in the study. Each student looked at a number of pictures and was required to describe what was seen in each picture in a single thirty-five to forty word sentence written within a five minute time limit. Explicit instructions were provided as to what should be written about in the picture.

Wise (1958) examined three hundred and forty compositions randomly selected from written language folders in one hundred and sixty-five classrooms at the first, second, and third grade level. The mean sentence length; the number of prepositional phrases; the number of different prepositions, subordinating conjunctions, and relative pronouns; and the number of complex, compound, and compound-complex sentences were all found to increase over grade level.

The final study reported in this section was one conducted by Sam (1962). He had three hundred children for each of grades four, five, and six listen to an incomplete adventure story and then write an ending for it within a half hour time limit. Only ten

percent of the sentences written were selected for analysis which averaged out to less than two sentences per subject. An analysis of variance was used to investigate the effects of grade, sex, and residence (urban, suburban, rural) on parts of speech and sentence length, type, and complexity. Sentences not identified by punctuation or capitalization were determined by whether they expressed a complete thought and had a subject and a predicate.

Sam found a significant increase over grades four to six for sentence length means accompanied by significantly greater use in sentences of dependent and independent clauses; adjective and adverb phrases; and most parts of speech. Significant differences were also found in terms of sex with the girls using longer sentences and more dependent clauses, pronouns, verbs, and infinitive phrases. Urban students wrote more dependent clauses in sentences, but residence otherwise had little effect on the written language.

Summary. A number of the basic trends, findings, and problems associated with the foregoing research studies are evident at this point. Two further traditional studies (Fea, 1953; Harrell, 1957) are presented in the second section of this chapter, but their findings do not basically contradict the following points.

The most consistent finding of the traditional studies in terms of written language development at the grade four, five, and six levels, was an increase in the amount of subordination used across successive age/grade groupings. There was considerable evidence to indicate that this growth was part of a continuum running throughout the school years and possibly beyond.

The measures used to determine increasing subordination were characterized by their diversity: mean sentence length; increases in complex and compound-complex sentences; number of dependent clauses per sentence; coordinate clauses divided by subordinate clauses; etc. Most of these measurements were based on the sentence which was frequently improperly constructed by children in the upper elementary grades, yet only the studies by Heider and Heider (1940) and Sam (1962) attempted to define what they considered to be a sentence. The sentence was often also the basis upon which the frequency of occurrence of other elements such as phrases and parts of speech were calculated.

Dissatisfaction with the often subjective nature of the sentence led researchers like Seegars (1933) and LaBrant (1933) to propose alternate measures based on the clause. LaBrant's subordination index (number of dependent predicates divided by the total number of predicates) was used in several studies (Heider and Heider, 1940; Watts, 1944). Although the subordination index rose with age in these studies, its value at any particular age showed considerable variation between studies.

The failure to determine anything approaching absolute age values for any of the measures used by the traditional studies was apparent to a number of the researchers. They most frequently attributed the differences which were found between investigations to variations in subject matter. Seegars (1933) bolstered this argument somewhat with his finding that subordination was affected by the category of discourse used. However, scant recognition was given

by the researchers to the effect of factors such as the nature of the population and the methods employed in collecting the data.

A few investigators looked at factors other than age/grade level which might be related to subordination. LaBrant (1933) and, to a greater extent, Watts (1944) claimed a positive relationship existed between mental age and subordination. Research by Frogner (1933) did not indicate such a link. The effect of sex was studied by LaBrant (1933) who found no relationship and by Sam (1962) who found that girls wrote more dependent clauses per sentence.

A growing awareness of a need for further and more refined indices of language development was apparent in the research. Watts proposed the measurement of the average number of different kinds of dependent clauses and suggested that the use of phrases instead of clauses might be a further indicator of maturity. Heider and Heider (1940) tried to determine the relative difficulty associated with writing various types of subordinate clauses. Wise (1958) found that the number of different prepositions, subordinate conjunctions, and relative pronouns were related to grade level.

The lack of specific guidelines necessary for replication of the traditional studies is nearly universal. By the same token it is difficult to make comparisons between them. Only the studies by Bear (1939), Heider and Heider (1940), Biscoe (1951), and Sam (1962) provide a reasonable description of the population studied. With the exception of LaBrant (1933), Heider and Heider (1940), and Biscoe (1951), the stimulus for the writing is either vague or unknown. LaBrant's (1933), Biscoe's (1951), and Sam's (1962) written samples were

obtained within a single session of short duration while in the other studies time limits were either non-existent or unstated. One final point noted in reviewing these studies was the almost complete absence of any statistical tests of significance. The only exceptions in this regard were the studies by Biscoe (1951) and Sam (1962).

The second part of this section examines some of the studies in written language development which were influenced by methods of language analysis other than the traditional.

2. Other Studies

Sam and Stine (1965) used an analysis based on structural linguistics to analyze the written compositions of fifty boys and fifty girls for each of grades four, five, and six. The children were asked to write an ending to a taped adventure story within a fifteen minute time limit. All clauses in their writing were classified according to five different structural patterns: noun-verb-noun; noun-verb; noun-verb(linking)-adjective; noun-verb (linking)-noun; and noun-verb-noun-noun. The first four patterns were found to be used significantly more frequently by girls and increases across grade levels were found for all patterns except the first and the last. However, these results may have simply reflected the fact that significantly more sentences were written by girls and by children at successive grade levels.

The researchers also tallied the occurrence of four types of clausal modifications (adverbs, prepositional phrases, verbals, and subordinate clauses introduced by because or who). They found no significant effects for sex or grade on these measures.

One of the problems with Sam and Stine's study was that the brevity of many of the written samples obtained may have been unrepresentative of the range of patterns and clausal modifications known by the students. Only fifty-six children wrote more than ten sentences and sixty-four wrote three or fewer sentences. Clausal modifications were analyzed for twenty percent of the sentences which worked out to an average of 1.3 sentences per child.

A similar type of study was conducted by Zeman (1966) who also used an unfinished story as a stimulus for collecting writing in a fifteen minute time span from one hundred and eighty second and third graders. Using ten structural patterns which were basically an expansion of those used by Sam and Stine, he found that with one exception they did not differentiate the children on the basis of grade, sex, or level of reading comprehension. The pattern noun-be-adverb (time or place) was used significantly more at the higher grade. Zeman utilized a more valid basis for comparison by employing proportional frequencies of occurrence within the compositions.

Hunt (1965) was first to make some use of transformational-generative linguistics in written language research. He carried out an in-depth assessment of the written language of students in grades four, eight, and twelve. Thousand word samples taken from regular classroom writing were obtained for nine boys and nine girls at each of these grade levels. All students had I.Q.'s within the average range (ninety to one hundred and ten) on the California Test of Mental Maturity.

Hunt was in search of a more refined procedure for the

measurement of syntactic development in writing. To this end, he applied a wide variety of measures to the students' writing and tried to determine statistically which provided the best indicator of a student's grade. Before beginning this analysis, Hunt eliminated a small percentage of words (less than .2%) that occurred in what he termed garbles. These were groups of words which were not understandable within the context in which they were placed.

Hunt argued that sentence length was an unreliable index of language maturity as younger, less experienced students frequently wrote long sentences by failing to punctuate and/or by the excessive use of and to link main clauses. He held that those investigators who edit the students' writing by supplying punctuation and breaking up run-on sentences, simply create a subjective unit of questionable validity.

Determining the mean sentence lengths written by the students in his study, Hunt found a significant gain in length over grade level. However, the range of scores at each grade level indicated a great deal of overlap in the three grades. One fourth grader had a greater mean sentence length than any of the twelfth graders.

He also examined the utility of clause length and the subordination ratio. LaBrant (1933) had found that the number of words per clause remained "comparatively constant between ages eight and sixteen" (LaBrant, 1933, p. 485) but Hunt pointed out that this finding was based on a procedure which counted coordinated verbs as separate clauses. Adopting the more conventional view of a clause as containing a subject and a finite verb, he noted a significant

increase in main clause length over grades four, eight, and twelve. A significant growth was noted, as well, for the subordination ratio (subordinate clauses divided by all clauses).

As a result of these findings, Hunt decided to investigate the usefulness of a unit which would reflect increases in both clause length and subordination. This unit consisted of a single main clause and any subordinate clauses which might be attached to it and was named the T-unit by Hunt. After dividing the students' compositions into T-units, the mean length of T-units was found to grow significantly for increase in grade. Contingency coefficients indicated that T-unit length provided the best index of a student's grade level followed in descending order by clause length, subordination ratio, and sentence length.

Eighteen samples, each a thousand words in length, were chosen from Harper's and Atlantic magazines to compare the writing of the students with that of superior writers. When this fourth group was included, clause length and T-unit length excelled equally as the best developmental indices. This resulted from the fact that clause length grew the most between grade twelve and the superior adult category. Hunt concluded that "for indicating maturity from grades four to twelve, T-unit length seemed to be the best overall index" (p. 58).

He then turned his attention to determining which factors were most responsible for this lengthening of T-units. It was discovered that the number of adjective, adverb, and noun clauses per T-unit each increased at successive grade levels. Increases in total

occurrences over grade were significant for adjective clauses and to a lesser extent for noun clauses, but failed to reach a level of significance for adverb clauses. For the three clause types, only the number of adjective clauses correlated significantly with the length of T-units written by the students.

The following noun modifiers increased over grade and were significantly correlated with clause length: adjectives, genitives, infinitives, present participles, and prepositional phrases (phrases with _of_ excluded). This development was attributed to the older students' ability to use such noun modifiers to express more concisely what formerly might have necessitated the use of clauses. Classifying each noun by its number of non-clausal modifiers revealed that higher grades more frequently used greater numbers of such modifiers in combination.

Although its effect on clause length was fairly limited, more expansion of the verb auxiliary was carried out by older students. Significant increases were noted for the occurrence of passive forms, perfect forms, _can_, and a group of six other modals (will, would, shall, should, may, might).

Following investigation of a number of other nonclause structures, it was apparent that clause lengthening was mainly due to greater use of nonclause modifiers of nouns. T-unit length was, in turn, largely affected by this development, plus increases in the use of adjective clauses. While Hunt's analysis was confined to an examination of surface structure, most of the structures investigated were seen as being the product of various sentence-combining

transformations as defined by transformational grammarians.

A couple of the limitations for the findings of this study were the small number of students and the lack of controls in obtaining the writing sample. In several instances, Hunt referred to the possible effect of subject matter and mode of discourse on the use of certain structures. Thus, he wondered if the findings from his study would "still exist when students in different grades all say the same thing" (p. 151).

A number of studies were to follow which attempted to explore this question with respect to mode of discourse. Bortz (1969) had fifty students for each of grades four, five, and six write three compositions apiece. The three topics were chosen to elicit a narrative, a descriptive, and an expository paper. Students listened to taped instructions; engaged in a short discussion; and were then allowed to write on the topic for twenty-five minutes.

He found that average T-unit length increased significantly over the three forms of writing in the following order: descriptive, narrative, expository. On a per sentence basis, expository writing had significantly more adverb and noun clauses while descriptive writing had more adjective clauses than the other forms. However, Bortz did not state how sentence boundaries were determined other than to say that sentences containing three or more independent clauses were "arbitrarily but sensibly divided" (p. 23).

The effect of mode of discourse and of reading ability on syntactic complexity, as primarily measured by T-unit length, was studied by Perron (1976). One hundred and three children forming

approximately equal groups at grades three, four, and five were each required, over a two week period, to write an argumentative, an expository, a descriptive, and a narrative paper. Each topic was read to the children and after a five minute discussion, they were given twenty minutes to write their paper. Within each grade level, Gates MacGinitie test results were used to establish high, mid, and low reading ability groups.

From the longest to the shortest, the mean length of T-units was as follows for each grade: argumentation, exposition, narration, description. The differences were all significant except between exposition and narration at grade four and grade five. At each grade level, the magnitude of the difference between the modes with the longest and shortest T-units was greater than the gap which Hunt (1965) found between grade four and grade eight. T-unit lengths also showed significant increases from low to mid to high reading ability groups for each grade.

In a study conducted in England, Britton and others (1975) argued that classifying writing by mode of discourse categories was difficult. They proposed that written language could be more profitably studied by examining the different functions and audiences which it serves. Using eleven audience and fifteen function categories, three judges classified over two thousand compositions written by five hundred students in the first, third, fifth, and seventh year of secondary school (ages eleven to eighteen). A number of trends were noted over these grade levels with the main change being an increase in the proportion of analogic writing

(writing in which generalizations are made and related) and of writing which was done in anticipation of assessment. The investigators felt that linguistic analysis within the framework of their categories might prove valuable. A need for further delineation of the categories was also evident. In only about one third of the function and one half of the audience classifications were all three judges in agreement.

Summary. Improvement in research design was one of the more evident differences between the traditional studies and those just reviewed. Generally, in the latter studies, statistical tests of significance were applied; and the population, writing stimulus, and units of analysis were better defined. There was also a greater awareness and control of factors which might affect syntactic complexity in addition to age, such as reading achievement, intelligence, sex, and mode of discourse.

The limited time provided for writing in some studies (Perron, 1976; Sam and Stine, 1965; Zeman, 1966) could well have affected the reliability of some of their findings. The wide variety in complexity of structures subsumed under individual structure patterns in studies like Zeman's and Sam and Stine's limited the usefulness of such patterns for analysis. For example, in Sam and Stine's study, the noun-verb pattern would include both of the following sentences: "Boys run. The tall boys with blue shorts are still running very swiftly" (Sam and Stine, 1965, p. 22).

Hunt's T-unit appeared to offer a more objective and useful measure for the segmenting of written language than the sentence.

The merits of T-unit length as a measure of syntactic complexity are further explored in some of the investigations in the next section. This section contains studies directed at an examination of both oral and written language from traditional and more recent linguistic viewpoints.

II. STUDIES RELATING CHILDREN'S ORAL AND WRITTEN LANGUAGE

Studies which compare children's oral and written language have generally been of recent origin. Fea (1953) had one hundred and forty grade fives and sixes listen to the reading of a story and then retell it orally and in writing. His major finding using LaBrant's subordination index was that the mean amount of subordination was the same for the oral and written language. A tendency was also noted for those who were more fluent (measured by number of words) in oral language to also be more fluent in written language.

Somewhat different results were obtained by Harrell (1957) using the subordination index. Forty boys and forty girls were studied for each of the age groups nine, eleven, thirteen, and fifteen which corresponded to grades four, six, eight, and ten, respectively. The Minnesota Scale for Paternal Occupations was used to stratify each group of forty to approximate the percentage breakdown of urban occupations in the 1940 United States census. Two black and white, ten minute sound films about the adventures of three bearcubs were employed to gather the language sample. One film was used for a written response and a few weeks later the other film was shown for an oral response, both responses being narrative in nature.

The stories were primarily examined in terms of LaBrant's subordination index, clause length, and types of subordinate clauses with the results being interpreted in the light of occupational status, I.Q., sex, chronological and mental age. No significant increase in the mean length of clauses over age for oral or written language was found. This finding was based on LaBrant's (1933) definition of a clause as any complete predicate rather than the usual description of a clause. Oral clauses were significantly longer than written clauses except at age fifteen, a difference felt to be accounted for by the greater use of conjunctives and other connectives in the oral stories.

The mean subordination index for written language increased at successive ages with values fairly comparable to those found by Heider and Heider (1940) but different from LaBrant's (1933) and Watts' (1944). Harrell believed that this might be due to the use of dissimilar populations and modes of discourse. At all ages but nine, the written subordination index was significantly greater than the oral subordination index. To explain this, it was suggested that in the early stages writing was more like speech, but that later it diverged due to an expanded knowledge of the mechanics of writing. Two additional explanations set forth were that the greater time for reflectivity when writing and its more formal nature led to a greater use of subordination.

Partial correlation coefficients indicated that chronological age with its direct link to years of school instruction was more related than mental age to the subordination index. This relationship

was stronger for written than oral language. Oral and written subordination indices were found to correlate significantly with I.Q., but only at ages eleven and thirteen in written language. One reason for the lack of relationship was thought to be the restricted I.Q. range which resulted from using only one age within a grade. The possibility that brighter older children might use more alternatives to subordinate clauses was also stated. Occupational status was not significantly correlated with the oral subordination index, but had a low significant correlation of .12 with the written subordination index.

The percentages of total clauses which were adverb, noun, and adjective clauses increased at each age level for both oral and written language. In the written stories, the order of frequency was adverb, noun, adjective, except at ages thirteen and fifteen when adjective clauses became second most frequent. The order throughout the oral stories was noun, adverb, adjective.

The mean number of adverb clauses was greater in written than oral stories for each age and significantly so at age thirteen. Harrell suggested that this likely reflected "the children's better understanding of the time sequence while writing than while speaking" (p. 53). Although no significant differences were noted, the mean number of noun clauses in the oral stories exceeded those in the written stories at each age. Some evidence was produced to indicate that this might be a result of a greater occurrence in oral language of noun clauses following verbs such as <u>think</u>, <u>say</u>, <u>guess</u>, etc. used in the first person.

A structural linguistic description comparing children's oral and written language and the language of basal readers was conducted by Riling (1965). Two hundred grade fours split into equal groups of Negroes and Caucasians and one hundred Caucasian grade sixes were studied. Group tests of intelligence, reading, and personality were administered to the students. A written and then an oral narrative account were obtained using a different picture stimulus for each. No minimum but a maximum of twenty-five independent verbalizations for each of the oral and written stories were analyzed.

The first level of analysis looked at the frequency of occurrence of the different patterns in which the basic grammatical elements were arranged. Analysis at the second level was concerned with the way in which these elements were elaborated or modified.

The number of different structural patterns for both oral and written language increased at grade six. More different patterns were used in oral than written language by each of the three groups of children. The subject-verb-direct object was the most common pattern for oral and written language at grades four and six.

Riling noted that the there - verb to be - subject pattern (e.g., There is a dog) was much more common in fourth than sixth grade writing. She felt that this resulted from many of the younger children describing the picture instead of telling a story about it. This raises a question about the adequacy of her stimulus and whether she was trying to compare fourth grade writing with a large element of description against more strictly narrative writing at the sixth grade. If such were the case, it helps to explain other findings such

as the increased use at the sixth grade of the subject-verb-direct object structure preceded by a moveable of time (structures involving time ranging from a single word to a clause). This pattern shifted from being the third and fourth most frequently written pattern in the two fourth grade groups to the second most frequent pattern at the sixth grade. Structures with a moveable of time were used more in written than oral language, a finding supported by Harrell (1957) in terms of clauses of time.

Examining the elaboration of basic sentence elements, Riling found that grade sixes used more adverbial phrases of manner and time and more clauses associated with the verb than grade fours. At both grades in written language more phrases were employed to elaborate the grammatical subject than in oral language. Participles occurred more often and infinitives more infrequently in written than in oral language across the grades. Children in the highest quartile on a verbal intelligence test used more phrases and clauses of time in writing than those in the lowest quartile.

The majority of Riling's findings were reported by frequency of occurrence and were hard to interpret due to the manner of their presentation. There was almost a complete lack of any statistical tests of significance and the total amount of language being studied in the various categories was often unclear. For example, it was indicated that substantially less was written than spoken, but the exact size of the written sample was never stated.

The analysis conducted by O'Donnell, Griffin, and Norris (1967) looked primarily at the numbers and functions of

sentence-combining transformations occurring within written and oral T-units. One hundred and eighty children from kindergarten, grades one, two, three, five, and seven (thirty at each level) composed the sample. After viewing a film with the sound track off, each child told the story and answered several related questions. Following this, children at grades three, five, and seven wrote the story and answers for the same questions.

They found that there was an increase in the mean word length of written T-units across grades three, five, and seven which was significant at the fifth grade level. At the third grade level, oral T-unit lengths were longer than written T-unit lengths, but the reverse held at the fifth and seventh grades.

The lengthening of T-units was considered to result mainly from greater numbers of sentences being embedded within T-units through the use of sentence-combining transformations. The fact that the mean number of such transformations per T-unit increased in the directions cited above for T-unit length was felt to attest to a link between the two. It was noted that this correspondence of increasing T-unit length and number of transformations per T-unit varied. One reason given for this variance was that T-units can be lengthened by other means (e.g., expansion of the auxiliary). In addition, the variation in length of the syntactic structures resulting from different sentence-combining transformations is not reflected by a count of these transformations.

The sentence-combining transformations were broken into three types: nominals, adverbials, and coordinations. Within T-units,

nominal and adverbial constructions each increased significantly in writing at the fifth and seventh grade levels. Nominals were used to a significantly greater degree in writing than speech at these grades. Noun clauses were a more common nominal construction than adjective clauses at the three grades for both oral and written language. Harrell (1957), in contrast, had noted that adjective clauses become more prevalent than noun clauses by thirteen years of age in written language.

Hunt (1965) had found that coordination structures within written T-units had a higher usage at the eighth than the fourth grade, but were less used at the twelfth than the fourth grade. O'Donnell, Griffin, and Norris (1967) found that such coordination increased significantly at the fifth grade and then fell slightly at the seventh grade. These two findings led them to suggest that the use of coordination within T-units was fully developed by about grade five or six.

Of eleven structural patterns studied for main clauses, O'Donnell et al. found the subject-verb and subject-verb-object accounted for approximately eighty-five percent of both oral and written patterns in grades three, five, and seven. Little in the way of grade differences in the usage of the eleven patterns was noted in oral or written language. The there-verb-subject pattern was used only slightly less in grades five and seven as compared to grade three, a finding at variance with Riling's (1965) results. This difference was felt by O'Donnell et al. to be due to the different stimuli used to gather the language in the two studies.

Clear-cut sex differences were not located except in the third and fifth grade writing where girls were superior to boys on a number of measures. The results also indicated that syntactic control was better for oral than written language at the third grade, but that the converse of this was true at the fifth and seventh grades. Finally, while the investigators believed that the frequency of all sentence-combining transformations per T-unit provided an objective and valid measure of growth in syntactic control, it was seen as time-consuming and complex to use. Mean T-unit length, they felt, offered basically the same benefits as a measure, without the above liabilities.

A Canadian study by Braun (1969) examined children's language at grades one, four, and six using the same sentence-combining transformations employed by O'Donnell et al. (1967). At grades four and six both oral and written language were studied. For every grade, twenty-four students were chosen from each of the following three communities: German bilingual, French-Canadian bilingual, and Anglo-Saxon monolingual. A filmstrip and an incomplete film were used to obtain oral and written language samples. I.Q.'s and reading achievement levels were determined through group tests.

Braun found that the mean length of T-units both oral and written was significantly greater in the monolingual community, at higher ability levels (as determined by I.Q.), and at the sixth grade. Reading achievement failed to show a relationship with T-unit length except in oral language where a positive relationship existed at the first and sixth grade level.

The number of sentence-combining transformations in writing

was significantly greater for the sixth grade, the monolingual community, and higher ability levels. In oral language the only difference in these findings was that the fourth grade made significantly greater use of such transformations. However, when the number of sentence-combining transformations per T-unit was calculated for oral language only the monolingual community remained significant. In written language this calculation was only made for the effect of community and no significance was found.

Throughout his study, Braun rarely reported his results on a proportional basis such as the number of occurrences per T-unit. This often made results difficult to interpret due to differences in the amount of oral and written T-units produced by certain subgroups.

Loban's (1976) study provided a longitudinal examination of children's oral and written language. He had been able to assess the language of two hundred and eleven children on a yearly basis as they progressed from kindergarten to grade twelve. Each spring an oral interview was conducted covering a variety of topics which were changed over the years in consideration of student maturation. From the third grade on a written composition was also obtained. Teachers' yearly ratings of a student's language proficiency were averaged and the thirty-five highest and thirty-five lowest students were identified. A third group of thirty-five students was randomly selected. At every grade for each of these students, thirty consecutive communication units were selected for detailed analysis in both oral and written language (grades three to twelve for writing).

The communication unit which was used to segment the children's

language was structurally defined as "each independent clause with its modifiers" (p. 9). As such it was the equivalent of Hunt's T-unit. Loban also found the following two additional categories of communication units to be necessary for oral language:

> 1. Each answer to a question, provided that the answer lacks only the repetition of the question elements to satisfy the criterion of independent predication.
>
> 2. Each word such as 'Yes' or 'No' when given in answer to a question such as 'Have you ever been sick?'. (p. 9)

At each grade, the average number of words per communication unit was quite close between oral and written language for each of the three groups (High, Low, and Random). Oral communication units were slightly longer until grade ten when written units began to be longer. O'Donnell et al. (1967) had discovered this shift occurring at the fifth grade in their study. Loban found that both oral and written communication units showed a progressive lengthening over the grades, although this growth pattern was somewhat erratic in writing after the sixth grade.

At each grade, the High group had longer communication units than the Low group in both writing and speech. This same grade level gap between the two groups was generally evident as Loban took a closer look at ways in which communication units were lengthened. He found that the average number of dependent clauses per communication unit and the number of words in dependent clauses as a percentage of words in communication units both differentiated between the High and Low groups except beyond grade nine in writing.

Loban believed that this exception occurred because students from about the eighth grade on made greater use of alternative ways

to the clause for subordinating ideas in writing. He set up a weighted index of elaboration containing language variables which could expand a communication unit. At one end of the scale items like adverbs and adjectives received half a point, while, near the other end, variables like participial and infinitive phrases received five points. The average number of elaboration points per written communication unit was found to be larger for the High than the Low group from grade three through grade twelve. From the fourth grade on, with the exception of the eleventh grade, the High group had more elaboration points per communication unit in written than in oral language. The Random and Low groups, however, continued to use more oral than written elaboration until the eighth grade.

The Minnesota Scale for Paternal Occupations was used to place the students into socio-economic groups. They were also classified into three ethnic groups: Caucasian, Black, and Oriental. No differences occurred in language ability on the basis of ethnic background, but Loban's results led him to conclude that greater language complexity was related to higher socio-economic status.

Summary. The scarcity of research examining both the oral and written language of children severely limits the drawing of conclusions as to similarities and dissimilarities between the two forms of language. In addition, there are a number of factors evident in the foregoing investigations which make the comparison of results across studies difficult.

Fea (1953) and Harrell (1957) appear to have studied narrative discourse while the other studies seem to have looked at narrative

mixed with other styles of discourse. The measures used to compare oral and written language have varied considerably from study to study, as have the ethnic and socio-economic composition of the populations examined.

However, despite such differences some directions are apparent in the findings of these studies. When the same stimulus was used to obtain both the oral and written discourse, children used more words, on the average, to communicate orally than they did in writing. The one exception being the grade six students in Braun's (1969) study whose oral and written samples were approximately equal in length.

Harrell (1957) and O'Donnell et al. (1967) found some evidence to suggest that children have superior syntactic control in oral as compared to written language until about the fifth or sixth grade. Loban (1976) found this shift to greater syntactic control in writing occurring in the fourth grade for students judged high in language proficiency by teachers. In his study, the same change did not happen for those considered low in language proficiency until the eighth grade.

Hunt (1965) had contended that T-unit length was one of the more useful indicators of growth in the syntactic complexity of written language over age/grade groupings. The studies by O'Donnell et al. (1967) and Braun (1969) not only backed Hunt's conclusion but found T-unit length to be similarly helpful as a measure in oral language development.

III. CONCLUSION

This chapter has provided a review of studies which examined children's written language development as well as those which have compared children's written with their oral language development. With few exceptions, these studies have confined themselves to looking at syntactic factors in language with little attention being paid to the role of meaning. The emphasis given to syntax by a number of the linguistic schools of thought which influenced these studies may account, in part, for this bias. The utilization of the Semantic Potential Theory of Language as the theoretical base of the present study will permit an examination of both meaning and syntactical factors in language development.

Although the influence of different linguistic theories was apparent in many of the investigations which were reviewed, few of the studies attempted to clarify their theoretical bases. The present investigation clearly stems from the Semantic Potential Theory of Language.

In those instances where identical measures were used in different studies at a particular grade, the results often varied considerably. Some of this variance appeared to result from a lack of control of factors such as the mode of discourse examined and the age range included within a single grade level. The design for this study which follows in the next chapter is intended to overcome these and a number of other methodological failings noted in the preceding literature review.

CHAPTER III

THE DESIGN OF THE STUDY

This chapter provides a description of the experimental design of the study, the student sample selected, the procedure used for data collection, the instrument of language analysis, the scoring procedure, and the statistical treatment of the data.

I. THE EXPERIMENTAL DESIGN

The main purpose of this study was to describe the written language performance of nine, ten, and eleven year old children. A sample of one hundred and eight students was selected for the study, with equal numbers (thirty-six) for each age level. Children who had been accelerated or held back in their grade placement were not chosen in an attempt to equalize, to some extent, the amount of writing practice and instruction. The three age groups of nine, ten, and eleven years came from grades four, five, and six, respectively. At each age level, eighteen boys and eighteen girls were chosen, since some research results (Hunt, 1965; Sam, 1962) have indicated that sex may be a factor related to written language development.

Each child in the study viewed one of two films and immediately afterwards gave a written and an oral recall of the film.[1] The film seen and the nature of the task (oral, written) were balanced within

---

[1] Data for Part I of the project on oral language were obtained within this design.

each age level and sex group in an attempt to minimize the effects of order (see Appendix C for the arrangement of subjects by cell). The basic design was that of a three by two factorial.

	Male	Female
Age 9	Balance for film seen	Balance for film seen
Age 10		
Age 11		

II. SAMPLE SELECTION

The sample for this study was selected from four schools within the Edmonton Public School System. Within these schools, the numbers of nine, ten, and eleven year old children available were 231, 210, and 239, respectively. The sample was chosen on the basis of the following criteria:

1. Date of birth. The following dates were used to classify the nine, ten, and eleven year old children:

Age 9: April 21, 1967 - January 28, 1968

Age 10: April 21, 1966 - January 28, 1967

Age 11: April 21, 1965 - January 28, 1966

The rationale for selecting these dates was as follows. All data were collected between January 21, 1977 and January 28, 1977. A subsequent study in the project was to be completed in late April involving the same subjects, and the above date groupings ensured that

the age category of each child would not change between January and April.

2. Verbal I.Q. score. A number of studies have found a relationship between children's written language and verbal intelligence (Sharples, 1966; Braun, 1969). When they were in the third grade, the students had been administered a group intelligence test. The nine year olds had taken the Canadian Cognitive Abilities Test, Form 1, Level A. The other two age groups had been given the Canadian Lorge-Thorndike Intelligence Test, Form 1, Level A. For this study, a lower cut-off point was set at eighty-four which is one standard deviation below the mean of each of these tests. Only the results of the Verbal Battery for each test were used.

These Verbal Batteries are said to measure the ability to deal with abstract relationships presented in verbal terms. Both tests have the same authorship and the same format was used in their Verbal Batteries. The Verbal Battery of the Canadian Lorge-Thorndike Intelligence Test (CLTIT) consists of five subtests which are Word Knowledge, Sentence Completion, Verbal Classification, Verbal Analogies, and Arithmetic Reasoning. In the Verbal Battery of the Canadian Cognitive Abilities Test (CCAT), the Arithmetic Reasoning subtest is dropped.

The CLTIT (1967) was standardized in Canada and except for two test items is identical to the 1957 version of the Lorge-Thorndike Intelligence Test. Writing about the latter test, Freeman (Buros, 1959) says, ". . . the Lorge-Thorndike series is among the sounder group instruments available from the point of view of psychological

insights (with regard to both content and concept of intelligence) shown in selecting and developing materials . . ." (p. 481). His major criticism of the test was the limited data available on predictive and concurrent validity. The Manual for the CLTIT gives a split-half reliability coefficient of .945 for the Verbal Battery on a grade three sample (Wright et al., 1972). Correlations of .812 with the Stanford-Binet and .500 with the WISC Verbal Scale found in grade six samples for the Verbal Battery of the CLTIT were given as indicators of construct validity.

The CCAT (1974), while retaining the format of the CLTIT, has entirely new test items. Data on reliability and validity of the CCAT are not available. Grade three students in the Edmonton Public School System (1974-75) scored a mean of 108.8 and a standard deviation of 17.0 on the Verbal Battery of the CLTIT. The following year, grade threes in the same system had a mean of 107.1 and a standard deviation of 15.3 on the Verbal Battery of the CCAT. For both tests, the Canadian mean is 100 and the standard deviation is 16.

3. Reading achievement scores. Since a subsequent study in the project (Part IV) would include reading tasks, cut-off points were selected for the Paragraph Meaning subtest of the Stanford Achievement Test (1964). The Primary II, Intermediate I, and Intermediate II Batteries of this test had been administered in May, 1976 to the nine, ten, and eleven year old children, respectively.

Using Edmonton Public School System norms, the initial cut-off points chosen were the forty-fourth percentile for age nine and the twentieth percentile for ages ten and eleven. These points were chosen

to try to ensure that none of the subjects would be below a reading achievement grade level of 4.6 when they participated in the fourth study of the project. Shortly after these cut-off points were established it was determined that the fourth study could not be conducted during the 1976-77 school year which meant that reading was no longer a major factor in the sample selection. As a result, the age nine cut-off was lowered to the twentieth percentile to be consistent with the age ten and eleven cut-off points.

The Paragraph Meaning subtest in these three batteries consists mainly of a series of paragraphs from which words have been omitted. The student demonstrates his comprehension of a paragraph by selecting from four choices the correct word for each omission. Vocabulary is controlled so that the test does not become one of word knowledge. Reliability coefficients for this subtest in each of the three batteries are above .90 as determined by the split-half and K-R 20 methods (Kelley et al., 1966). Traxler (Buros, 1972) in reviewing the 1964 edition of the Stanford Reading Tests said it was ". . . the best series of reading tests now published for making annual or semiannual surveys of the reading achievement of pupils throughout the elementary and junior high school grades . . ." (p. 1102).

4. English as a second language. On the basis of data in the cumulative record folder, students who did not have English as a first language were not included in the study.

5. Other factors. Children with severe speech, visual, hearing, or emotional disorders were also excluded from the sample.

6. Permission. Parental and child permission for participation was obtained.

7. Occupation. A relationship between socio-economic status and children's written language has been noted in some studies (Loban, 1976). Occupation was noted for use in the analysis but was not employed as a criterion in the selection of subjects.

The occupation of the father and the mother were taken from the cumulative record folder. The California Socio-Economic Scale of Urban Occupations (Ruddell and Williams, 1972, pp. 163-189) was then used in classifying these data. The scale, based on a five-point socio-economic ranking of occupations, was designed for use in research on children's language. The ratings were derived on the basis of occupational income and educational level. The highest socio-economic rating is indicated by one (1) and the lowest by five (5). If one parent received a higher socio-economic rating than the other, the higher rating was used for the study.

When children who did not meet the above criteria had been excluded, the number remaining eligible for the sample (above diagonal) and the number selected randomly for the study (below diagonal) are given below.

	Age 9	Age 10	Age 11
Boys	40 / 23	27 / 23	48 / 23
Girls	49 / 23	48 / 23	38 / 23

After the data had been collected any child who had produced fewer than ten T-units of oral or written language was excluded from the group. Fewer than ten T-units was considered to provide insufficient data for analysis. A total of five students had written language samples in this category. From the children remaining, eighteen per cell were randomly chosen.

III. INSTRUMENTS FOR DATA COLLECTION

Two films, each twenty minutes in length were used in the collection of the data. One film, The Stowaway, was about an eleven year old boy who stowed away on a fishing schooner. The second film, The Huntsman, depicted a boy approximately ten or eleven years of age who searched for golf balls in order to sell them to golfers. Both films contained a minimal amount of conversation with the story unfolding through action in The Huntsman and narration in The Stowaway. The two different film types, that is, primarily narrative or primarily action, were employed to counteract the language bias which could result from the use of only one kind of input.

The type of film chosen was based on Cox's (1975) study of fourth and fifth grade children's film preferences. She found that children preferred films which portrayed children in realistic settings. Their preferences for film form/technique were: narrative/live-action, first and non-narrative/live-action, second.

In both of the films selected, the main character was a boy. It was difficult to find a suitable film in which a girl of comparable age starred. However, Cox did not find that the film interests of the children were closely associated with sex differences.

IV. PILOT STUDY

The pilot study was carried out in December, 1976 in an Edmonton Public School System school which was not assigned for the main study. A boy and a girl were selected at each of the age levels, nine, ten, and eleven years. The purposes of the pilot study with respect to this study were:

1. To decide on the suitability of the films.
2. To provide an estimate of the time required per student.
3. To obtain a sample of written language data to check the adequacy of the scoring procedures.

The results of the pilot study indicated that:

1. Both of the films which had been chosen appeared suitable.
2. Language samples could be obtained within an hour's timespan from a group of about six children.
3. Some streamlining of the scoring procedures for the language data could be achieved.

V. COLLECTION OF DATA

The physical requisites for conducting the study were as follows:

1. A room where about six children could view a film and perform the written assignment.
2. At least three other rooms where telephones had been set up and to which children could be assigned individually after viewing the film.
3. At least three other areas each containing a telephone

for a listener which was connected to one of the children's telephones.

The data collection proceeded through the following steps:

1. Prior to the date set for data collection, the researcher met with the children to explain the project and answer any questions. A letter requesting parental permission was sent home with each child at this time (see Appendix D).

2. On the data collection date, the researcher met with a group of six students and gave them the following directions:

> We are from the University and we are doing a project about how much you can remember about what you see. You are going to see a film. Afterwards you will be asked to do two things.
>
> 1. You will telephone an adult who cannot see the film and you will tell this adult <u>all</u> you can remember about the film.
>
> 2. You will pretend that a friend has moved to British Columbia. You will write this friend and tell <u>all</u> you can remember about the film.
>
> _____ will telephone first and
> (names)
>
> _____ will write first.
> (names)
>
> Those who write will stay in this room and when you telephone you will go to _____.
> (room)

3. Before viewing the film, the researcher asked if there were any questions.

4. At the conclusion of the film, three children left to go to the rooms where they would give the oral language sample. The three remaining stayed in the film room to provide the written language sample used in this study.

5. Before the children began to write, they were given the

following directions:

> If you make mistakes do not bother to erase. Just cross out the mistake and keep on writing. If you need to spell a word, raise your hand. (If there was a request for spelling, the researcher wrote the word on a piece of paper for the child.)
> Take your time and write all you can remember about the film.

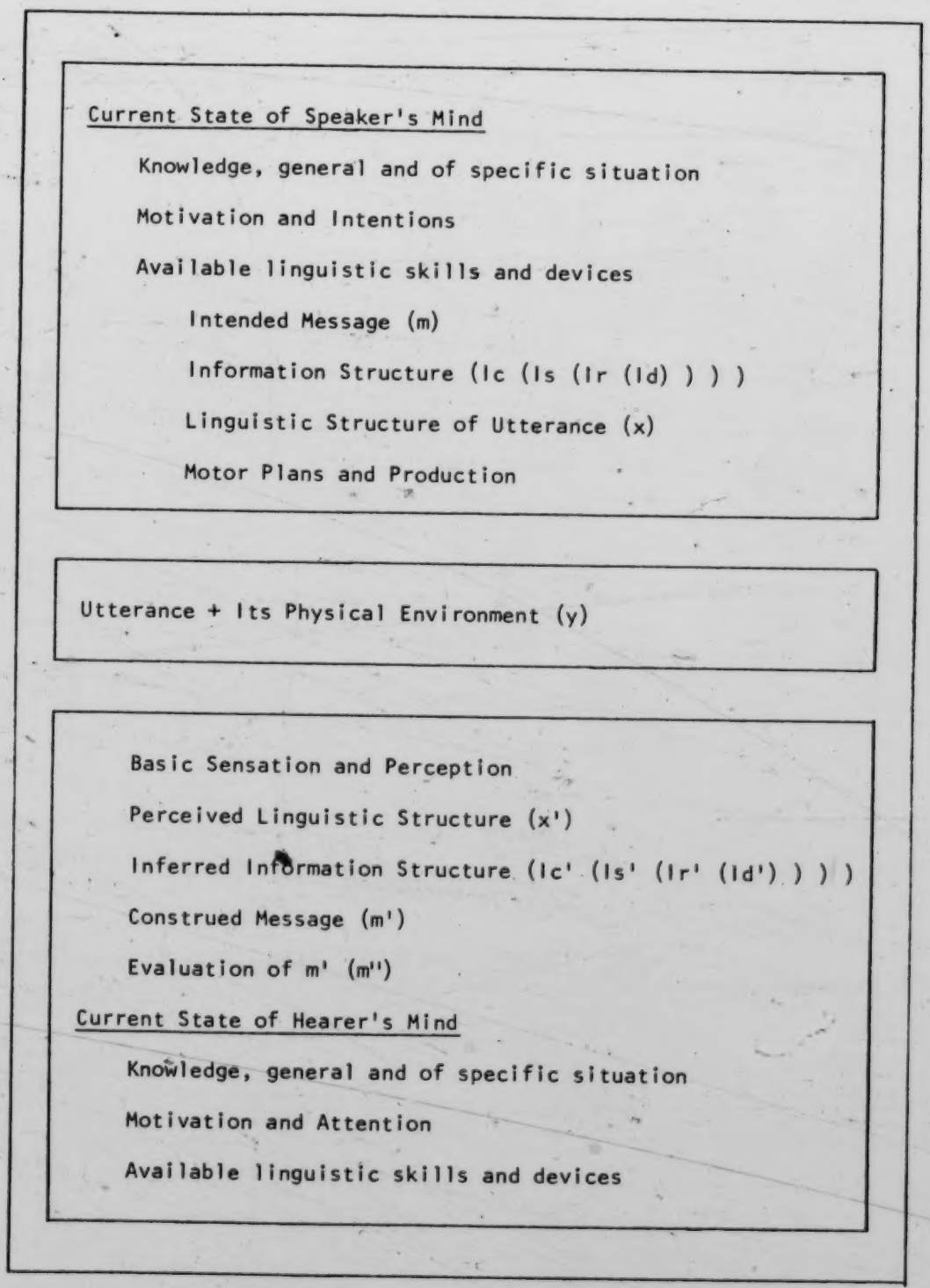
6. Each child upon completion of the writing or speaking task proceeded to the alternate task.

VI. THE INSTRUMENT OF LANGUAGE ANALYSIS

The basic theoretical framework for the analysis was provided by the Semantic Potential Theory of Language which is described in Part I of this project (Fagan, 1978). This theory is largely based on the Surface Generalization Theory of Language which is the result of work by Prideaux and colleagues of the Department of Linguistics at the University of Alberta (Prideaux, 1975; Baker, 1976). A diagram by Baker (1976, p. 11) on the following page shows the main components involved in these two theories. While the present study limits its focus to specific linguistic components within the theoretical framework which is diagrammed, the broader communicative situation in which these components occur should be kept in view.

The concept of a syntactically generated "deep structure," which is vital in transformational-generative grammars, is inadmissable in the above theories. They focus instead on describing the linguistic structure of the utterance in terms of the different types of information conveyed by the transmitter (speaker/writer) or superimposed upon it by the receiver (listener/reader). The utterance, of itself, possesses only a potential for meaning as the

COMMUNICATIVE SITUATION


Current State of Speaker's Mind
Knowledge, general and of specific situation
Motivation and Intentions
Available linguistic skills and devices
Intended Message (m)
Information Structure (Ic (Is (Ir (Id))))
Linguistic Structure of Utterance (x)
Motor Plans and Production
Utterance + Its Physical Environment (y)
Basic Sensation and Perception
Perceived Linguistic Structure (x')
Inferred Information Structure (Ic' (Is' (Ir' (Id'))))
Construed Message (m')
Evaluation of m' (m'')
Current State of Hearer's Mind
Knowledge, general and of specific situation
Motivation and Attention
Available linguistic skills and devices

reader/listener must interpret the information it conveys for meaning to occur.

In light of the above, the language analysis instrument used in this study measured the amounts of the following types of information conveyed in the children's written language samples: contextual information (Ic), sentential information (Is), relational information (Ir) and denotational information (Id). Sentential information involved a classification of sentences as declarative, interrogative, or imperative. The context within which the data were gathered for this study was expected to severely limit any occurrences of the latter two types of sentences. However, a tally of sentential information was kept for possible comparative use within Part III of the project on authors' text.

The instrument of language analysis defines an utterance to be a T-unit. The T-unit had previously been found to provide a measure of children's written language development (Hunt, 1965; O'Donnell et al., 1967). The instrument also provided for an analysis of the alternative syntactic structures to the basic T-unit used by the children to convey information. These syntactic structures were descriptively based on transformational-generative structures but without reference to a deep structure.

A detailed description of the language analysis instrument used in this study (with definitions and examples) is provided in Appendices A and B. The division of the written language samples into T-units is covered in Appendix A. The syntactic structures and the four types of information are contained in Appendix B.

VII. THE SCORING PROCEDURE

1. T-unit division. The first task was to identify all of the divisions for T-units, incomplete T-units, and mazes in the children's writing (see Appendix A). Two photocopies of each child's written language sample were made and the present researcher and the researcher in Part III of the project analyzed all of the language samples independently. Words crossed out were not analyzed.

2. Contextual, sentential, relational, and denotational information. Three passages were chosen randomly from each cell of the two-by-three factorial design. These eighteen passages were duplicated and then were analyzed independently by the same two researchers using the criteria given in Appendix B. The other ninety passages were then analyzed by this researcher for sentential, relational, and denotational information. In the case of contextual information, sixty of these passages were given to a graduate, with specialization in reading, for analysis with the other thirty being analyzed by the present researcher.

3. Syntactic structures. The data of all three parts of the project were analyzed for syntactic structures by the researchers for Part I of the project. The criteria used to identify the syntactic structures are to be found in Appendix B.

VIII. SCORING RELIABILITY

1. T-unit division, sentential, relational, and denotational information. A set of criteria for scoring the protocol was initially constructed. Frequent consultation was maintained with the researchers

for Part I and Part III of the project during the analysis of their data. Whenever changes in their analysis occurred, this researcher would if necessary rescore the written language samples to reflect these changes.

Comparisons were made between the T-unit divisions arrived at by the two researchers and a very limited number of differences were noted. These differences were examined and divisions were mutually agreed upon by the researchers.

A similar comparison was carried out by the two researchers when analyzing the subset of eighteen language samples for sentential, relational, and denotational information. Total agreement had to be achieved with the researcher for Part III of the project during the scoring of this subset before analysis was carried out on the remaining data. The above procedure led to a further refining and adapting of the criteria used to identify the different types of information. It also helped this researcher to be more proficient in applying the criteria to the analysis of the rest of the language sample. In addition, one protocol was chosen at random and scored in common by this researcher and a graduate student not otherwise involved in the project. The Arrington Formula for inter-scorer reliability (Feifel and Lorge, 1950, p. 5) was then used to calculate the following percentages of agreement:

	Percentage of Agreement
T-units	100
Sentential Information	100
Relational Information	93
Denotational Information	95

2. Contextual information. The steps taken for scoring reliability were the same as those given above except for the last step mentioned. Instead, the present researcher randomly selected and scored twenty-five percent of the written language samples analyzed by the graduate student. The following percentages of agreement were obtained using the Arrington Formula:

	Percentage of Agreement
Logical Information	94
Referential Information	96
Staging	98

IX. STATISTICAL ANALYSIS

A two-way analysis of variance was applied to the study's two-by-three factor design (sex by age level). All figures from the analysis of variance were taken without the additivity assumption. The Scheffé method of multiple comparison (Winer, 1962, p. 88) was used to locate differences existing across ages. The means for the cells of the factorial design were calculated, and were used to determine the direction of main effects (sex, age) which were either significant or approached significance.

T-tests were used to measure the effect of the type of film and the speak/write order on language output (total words and T-units). Pearson Product Moment Correlations were computed to examine the relationship between the children's written language and verbal intelligence, reading achievement, and socio-economic status. In order to compare the oral and written language samples of the nine,

ten, and eleven year old children, correlated t-tests were used.

With the exception of the Scheffé procedure, the level of significance was set at .05. Since the Scheffé procedure is a quite conservative one, the significance level was set at .10 as Scheffé suggests (Scheffé, 1959, p. 71).

In certain cases there was insufficient variance within a cell to allow for the completion of an analysis of variance. As a result, statistical analyses are not provided for some language variables.

CHAPTER IV

WRITTEN LANGUAGE RESULTS

This chapter sets forth the present study's results in relation to the null hypotheses, numbered one through five, in Chapter I. It is organized in the following manner: each hypothesis is restated, its rejection or non-rejection is given, the data which provided the basis for the decision are set out, and discussion of results follows. The tables of data indicate whether the results are being expressed as amounts of information per T-unit, or as total amounts of the information produced.

I. HYPOTHESIS 1

Hypothesis 1(a):

> There will be no significant differences in the number of words per T-unit over age levels nine, ten, and eleven.

This hypothesis was not rejected, since the probability of difference did not attain the level of significance ($p = .05$) adopted for the present study (see Table IV-1).

Discussion

The mean length of T-units in words was felt to provide a measure of written language maturity by the authors of three important language studies (Hunt, 1965; O'Donnell, Griffin, and Norris, 1967; Loban, 1976). While the present study found no significant difference in average T-unit length over ages nine, ten, and eleven, there was an increase across these age levels which closely approached

TABLE IV-1

SUMMARY OF A TWO-WAY ANALYSIS OF VARIANCE OVER AGE AND SEX FOR T-UNITS, WORDS PER T-UNIT

		Means		Variances				
Variable	Age	Boys	Girls	Boys	Girls	F-ratio		p
Total number T-units	9	20.111	25.500	43.517	173.088			
	10	25.111	24.556	257.635	80.850	Age	.615	.543
	11	25.667	25.556	89.413	92.498	Sex	.545	.462
Words per T-unit	9	9.325	9.911	4.562	5.871			
	10	9.193	10.317	1.727	1.357	Age	2.934	.058
	11	10.486	10.623	2.664	2.679	Sex	3.265	.074

significance. A comparison of T-unit length in the present study with those in the three studies just mentioned is provided by Table IV-2, and is graphically presented in Figure 4-1. Results for both Loban's Random and High group are given since the median verbal intelligence quotients for the three age groups in the present study fell about halfway between the median intelligence quotients for Loban's two groups.

According to the means in Table IV-2, longer T-units were written by the subjects in this study than by the subjects in comparable grades in the other studies. While many factors are undoubtedly involved in producing the variation found in mean T-unit length across these studies, at least two factors would seem to be of particular importance in this regard.

The first of these factors concerns the mode of written discourse which was employed. Perron (1977), in studying the written language of children in grades three, four, and five, found significant differences in the mean length of T-units depending upon whether the children wrote mainly in a descriptive, a narrative, an expository, or an argumentative mode. Hunt and Loban, neither of whom controlled the mode of written discourse in their studies, discovered respective increases over grades four to twelve of 5.8 and 5.25* words per T-unit. However, Perron found almost as large an increase (5.22 words per T-unit) between his fourth grade students' descriptive and argumentative writing.

The findings of O'Donnell et al. (1967) were based to a

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*Results are given for Loban's Random group.

TABLE IV-2

COMPARISON OF T-UNIT LENGTH

		O'Donnell (Gr. 3)	
		7.67	
Cameron (Age 9)	Loban (Gr. 4)*		Hunt (Gr. 4)
9.62	8.83 8.02		8.6
Cameron (Age 10)	Loban (Gr. 5)	O'Donnell (Gr. 5)	
9.76	9.52 8.76	9.34	
Cameron (Age 11)	Loban (Gr. 6)		
10.56	10.23 9.04		
		O'Donnell (Gr. 7)	
		9.99	
			Hunt (Gr. 8)
			11.5

*The first result is for Loban's High group and the second result is for his Random group.

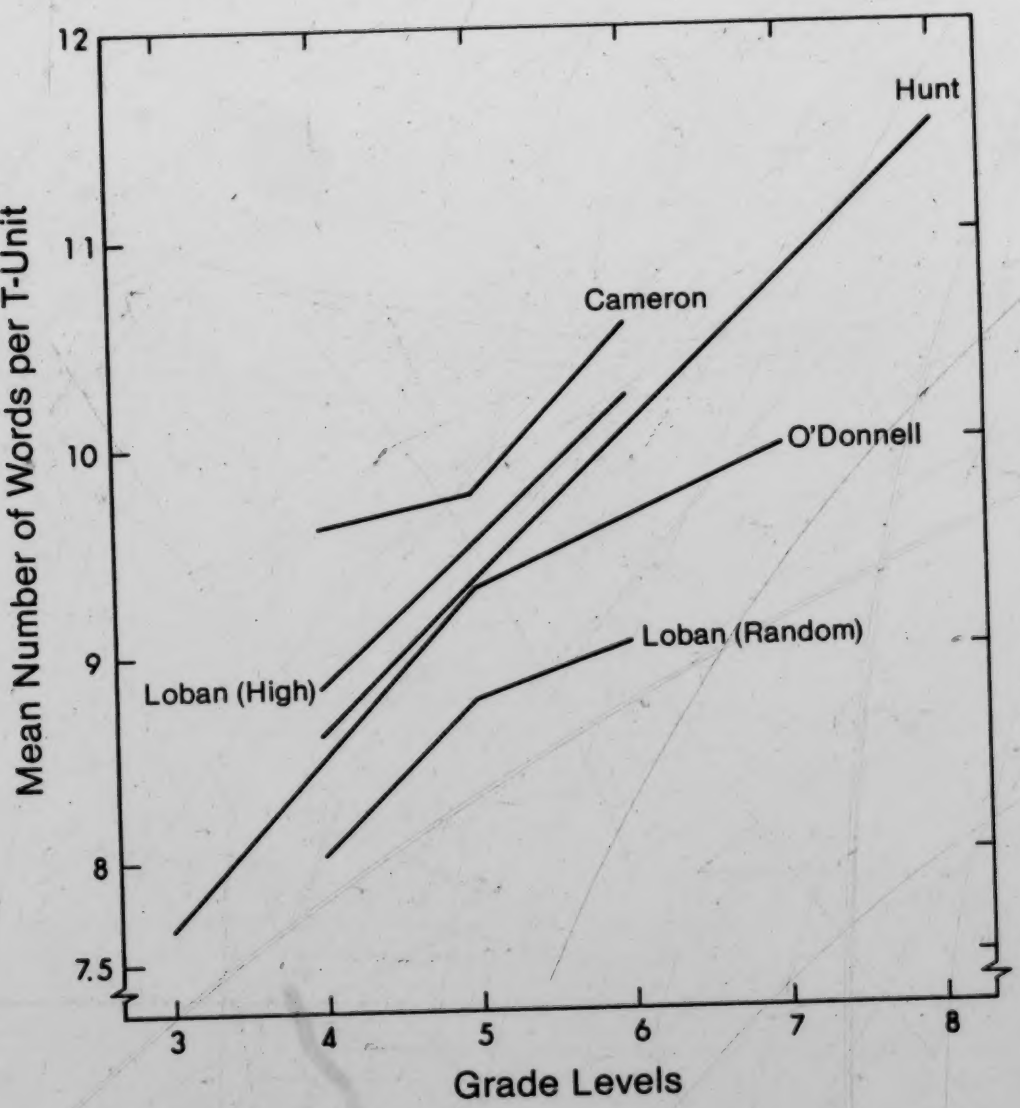

Figure 4-1 Comparison of T-Unit Length

considerable degree, but not entirely, on narrative language due to their inclusion of a series of questions "for the purpose of securing a sample of discourse other than simple narrative" (p. 32). In the present study, the children's writing was essentially confined to the narrative style. Perron obtained T-unit lengths of 8.91 words for the fourth grade and 9.56 words for the fifth grade when the children wrote in the narrative. These findings are closer to those reported in the present study than were the T-unit lengths reported by Hunt (1965), O'Donnell et al. (1967) and Loban (1976).

A second important factor which varied considerably across the studies under comparison was the nature of the sample. For example, the age groupings used in the present study (see Table IV-3) meant that students who had repeated or been accelerated a grade were

TABLE IV-3

DESCRIPTION OF THE SAMPLE BY AGE AND VERBAL INTELLIGENCE

		9 Years (Grade 4)	10 Years (Grade 5)	11 Years (Grade 6)
Age (Years)	$\bar{X}$	9.34	10.45	11.39
	S.D.	.27	.23	.19
	Range	9.0-9.75	10.0-10.75	11.0-11.75
Verbal Intelligence	$\bar{X}$	110.06	109.53	116.50
	S.D.	11.95	10.19	13.76
	Range	85-140	89-128	90-153

excluded. Hunt (1965) and Loban (1976) did not report the ages of the students in their studies and the ages given by O'Donnell et al.

indicated an absence of any age control within grades. At the third grade level, the students in the latter study ranged in age from seven years and four months to ten years and two months.

The use or non-use of cut-off points for intellectual test results was another important sample difference in these studies. Hunt (1965) used a lower I.Q. cut-off of ninety and an upper I.Q. cut-off of one hundred and ten. The present study used a lower cut-off of eighty-four (see Table IV-3). In Loban's (1976) study, his Random group had an I.Q. range of seventy-two to one hundred and twenty-four and his High group ranged from ninety-nine to one hundred and thirty-three. The I.Q. range in the study by O'Donnell et al. (1967) was from eighty-one to one hundred and forty-three.

These differences, then, in mode of written discourse and sample selection help to explain the variation in T-unit length found at similar age/grade levels in the different studies. However, despite such variation, the present study's results indicated a trend in line with the findings in the earlier studies that growth in T-unit length paralleled increases in age/grade level.

Hypothesis 1(b):

> There will be no significant differences over age levels nine, ten, and eleven in the number of (i) incomplete T-units, (ii) mazes per T-unit.

The hypothesis was not rejected, as the probabilities of difference did not reach the level of significance ($p = .05$). This decision was made on the basis of the results presented in Table IV-4.

TABLE IV-4

SUMMARY OF A TWO-WAY ANALYSIS OF VARIANCE OVER AGE AND SEX FOR INCOMPLETES AND MAZES PER T-UNIT

		Means		Variances			
Variable	Age	Boys	Girls	Boys	Girls	F-ratio	p
Total number incompletes	9	.389	.500	.487	.618		
	10	.611	.500	.958	.500	Age .193	.825
	11	.500	.611	.382	.166	Sex .048	.827
Mazes per T-unit	9	.019	.007	.001	.000		
	10	.006	.006	.000	.001	Age 2.777	.067
	11	.002	.004	.000	.000	Sex .951	.332

Discussion

Incomplete T-units were found at ages nine, ten, and eleven in the protocols written by eleven, ten, and twelve of the subjects, respectively. The incomplete T-units which these children wrote were classified into the following four types:

i. An inadvertent omission of one or more words. e.g. / so he blew the horn / but no answer /.

ii. The construction of a subordinate clause in isolation. e.g. / When the cook found him in the cupboards and went and told the captain /.

iii. A direct quotation made without reference to the speaker. e.g. / He said, "What are you selling?" / "Golf balls" /.

iv. The provision of more specific words for an antecedent. e.g. / then after that some of the men went out in a boat / two men /.

Corresponding to the above ordering of the four types of

incomplete T-units, the frequencies of occurrences were thirty-two, nine, twelve, and one. Careful proofreading by the students would probably have resulted in the correction of most instances of the first type and many of the second type of incomplete T-unit. While not all of the students who wrote the third type of incomplete T-unit included quotation marks, those who did were using a form of written dialogue often employed by authors.

There were basically two kinds of mazes which occurred in the children's writing:

i. A repeat involving the inadvertent repetition of a word or words. e.g. The boy went (up) up a hill with a big shady tree.

ii. An edit involving a word or words which precede a change in direction of what the person was about to write, or precede a better choice of words. e.g. He could stay only if he does his share of work so (he did had) he did his share of work.

Only sixteen repeat mazes and two edit mazes were produced by the children. There was some indication that the incidence of repeat mazes might be linked to experience in writing. At successive age levels nine, ten and eleven, the number of repeat mazes found were ten, two and four. This reduction took place even though the two older age groups were writing more words on the average than the nine year olds. The average number of words written at ages nine, ten and eleven were two hundred and nineteen, two hundred and forty-two, and two hundred and seventy, respectively.

Only a few of the previous studies on children's written language made reference to any occurrence of the kind of written

language categorized as incompletes and mazes in the present investigation. The garble which was defined by Hunt as, "any group of words that could not be understood by the investigators" (1965, p. 6) seems to have been used to cover both mazes and incompletes in his study. O'Donnell et al. (1967), in addition to employing the garble, had a category called grammatically incomplete clausal patterns, a number of which would have been classified as incompletes in the current study. In both of these earlier studies, the frequency of occurrence of garbles was found to decrease with increases in grade level. The more typical approach in written language studies to the phenomena classified in the present study as mazes and incomplete T-units has probably been that used by Loban (1976), who simply excluded them from any analysis.

II. HYPOTHESIS 2

Hypothesis 2(a):

> There will be no significant differences over age levels nine, ten, and eleven in the amounts of denotational information per T-unit.

This hypothesis was not rejected for nouns, adjective phrases, adjective clauses, negatives (noun), intensifiers, quantifiers, determiners, total noun denotational, verbs, verbals, adverb phrases, adverb clauses of time and condition, prepositions, connectives, expletives, and grand total denotational.

The hypothesis was rejected for adjectives, adverbs, negatives (verb), modals, and total verb denotational, since the probabilities of difference for these variables reached the level of significance ($p = .05$). Table IV-5 sets out the data upon which the decisions to

TABLE IV-5

SUMMARY OF A TWO-WAY ANALYSIS OF VARIANCE OVER AGE AND SEX FOR DENOTATIONAL INFORMATION PER T-UNIT

Variable	Age	Means		Variances		F-ratio		p
		Boys	Girls	Boys	Girls			
Nouns	9	2.918	3.013	.343	.418			
	10	2.938	3.216	.160	.104	Age	2.063	.132
	11	3.256	3.198	.231	.548	Sex	.998	.320
Adjectives	9	.197	.231	.011	.021			
	10	.196	.282	.016	.012	Age	3.995	.021
	11	.315	.285	.026	.020	Sex	1.345	.249
Adjective Phrase	9	.136	.145	.009	.010			
	10	.164	.140	.012	.012	Age	1.813	.168
	11	.161	.228	.016	.036	Sex	.487	.487
Adjective Clause	9	.047	.054	.002	.003			
	10	.060	.063	.003	.003	Age	.744	.478
	11	.052	.072	.001	.002	Sex	1.177	.280
Negative (Noun)	9	.004	.004	.000	.000			
	10	.010	.006	.001	.000	Age	.768	.466
	11	.016	.002	.001	.000	Sex	2.911	.091
Intensifier (Noun)	9	.008	.025	.001	.001			
	10	.006	.042	.000	.002	Age	.542	.583
	11	.017	.021	.001	.001	Sex	9.793	.002
Quantifier	9	.144	.236	.008	.020			
	10	.179	.228	.013	.013	Age	.201	.818
	11	.231	.187	.030	.013	Sex	1.715	.193
Determiner	9	1.372	1.425	.129	.191			
	10	1.305	1.453	.096	.090	Age	.831	.439
	11	1.434	1.528	.103	.146	Sex	2.074	.153
Total Denotational for Noun	9	1.908	2.119	.219	.395			
	10	1.920	2.213	.172	.166	Age	2.566	.082
	11	2.225	2.321	.273	.357	Sex	4.091	.046
Verbs	9	1.530	1.564	.137	.130			
	10	1.460	1.572	.040	.037	Age	1.385	.255
	11	1.599	1.641	.058	.042	Sex	1.432	.234

TABLE IV-5 (Continued)

Variable	Age	Means		Variances		F-ratio		p
		Boys	Girls	Boys	Girls			
Verbals	9	.132	.199	.014	.016			
	10	.148	.221	.014	.020	Age	1.400	.251
	11	.213	.216	.012	.018	Sex	3.923	.050
Adverbs	9	.310	.313	.025	.020			
	10	.282	.359	.018	.035	Age	3.409	.037
	11	.381	.409	.020	.015	Sex	1.568	.213
Adverb Phrase	9	.636	.698	.051	.073			
	10	.623	.793	.028	.036	Age	1.360	.261
	11	.780	.738	.071	.075	Sex	1.936	.167
Adverb Clause (Time)	9	.083	.057	.015	.007			
	10	.078	.083	.008	.004	Age	.969	.383
	11	.088	.109	.007	.006	Sex	.000	.988
Adverb Clause (Condition)	9	.038	.035	.003	.006			
	10	.035	.066	.002	.004	Age	1.771	.175
	11	.043	.085	.002	.004	Sex	4.069	.046
Negative (Verb)	9	.054	.057	.003	.002			
	10	.050	.092	.002	.003	Age	3.651	.029
	11	.089	.086	.002	.002	Sex	1.957	.165
Intensifier (Verb)	9	.007	.006	.000	.000			
	10	.005	.007	.000	.000	Age	.649	.525
	11	.012	.009	.001	.000	Sex	.055	.815
Modal	9	.078	.085	.004	.004			
	10	.117	.141	.018	.006	Age	7.347	.001
	11	.139	.174	.003	.007	Sex	1.929	.168
Total Denotational for Verb	9	1.342	1.451	.207	.236			
	10	1.339	1.770	.172	.092	Age	7.778	.001
	11	1.745	1.829	.145	.219	Sex	6.551	.012
Preposition	9	.719	.813	.045	.085			
	10	.720	.829	.036	.028	Age	1.014	.366
	11	.803	.888	.085	.132	Sex	3.627	.060
Connectives	9	1.152	1.047	.272	.184			
	10	.865	1.014	.082	.060	Age	1.842	.164
	11	1.082	.977	.061	.096	Sex	.084	.773

TABLE IV-5 (Continued)

Variable	Age	Means		Variances		F-ratio		p
		Boys	Girls	Boys	Girls			
Expletives	9	.023	.025	.001	.001			
	10	.023	.017	.002	.001	Age	.153	.858
	11	.021	.020	.001	.001	Sex	.066	.797
Total Preposition, Connective, Expletive	9	1.894	1.885	.484	.413			
	10	1.607	1.860	.130	.082	Age	1.258	.289
	11	1.906	1.885	.162	.180	Sex	.618	.433
Grand Total Denotational	9	9.591	10.033	5.185	6.249			
	10	9.263	10.631	1.724	1.296	Age	2.959	.056
	11	10.733	10.873	3.165	3.481	Sex	3.242	.075

reject or not reject were made, and Table IV-6 indicates where the significant differences occurred.

Discussion

For seventeen of the twenty-three types of denotational information examined, the means per T-unit increased at age ten and again at age eleven. All of the five variables for which significant changes were noted were part of this group of seventeen. The increases noted for these five types of information are graphed in Figure 4-2.

Both the ten and eleven year old students made significantly greater use of modals than did the nine year old students. In relation to the youngest age group, the ten year old group used fifty-seven percent and the eleven year old group employed ninety percent more modals per T-unit. Hunt (1965) had previously reported that the number of modals in students' written language increased significantly across grades four, eight, and twelve. He viewed this as possibly resulting from an ability on the part of the older students to provide "an increased shading or modulating of the meaning expressed by the main verb" (p. 122). It may be indicative of the growth of such an ability that eight of the nine year old students in the present study failed to use modals while all of the eleven year old students employed them. Between ages nine and eleven, the modals which showed the greatest relative increases were can, will, have (to), and should. The most frequently occurring modals at each of the three age levels were could, would, have (to), and will.

Adjectives per T-unit showed a significant increase of forty percent from ages nine to eleven. Both predicate adjectives and

TABLE IV-6

SCHEFFE COMPARISON OF MEANS FOR DENOTATIONAL INFORMATION OVER AGES

Variable	Age 9-10	9-11	10-11
Adjective		**	
Adverb		*	
Negative (verb)		**	
Modal	*	**	
Total denotational for verb		**	*

** .05 level of significance
* .10 level of significance

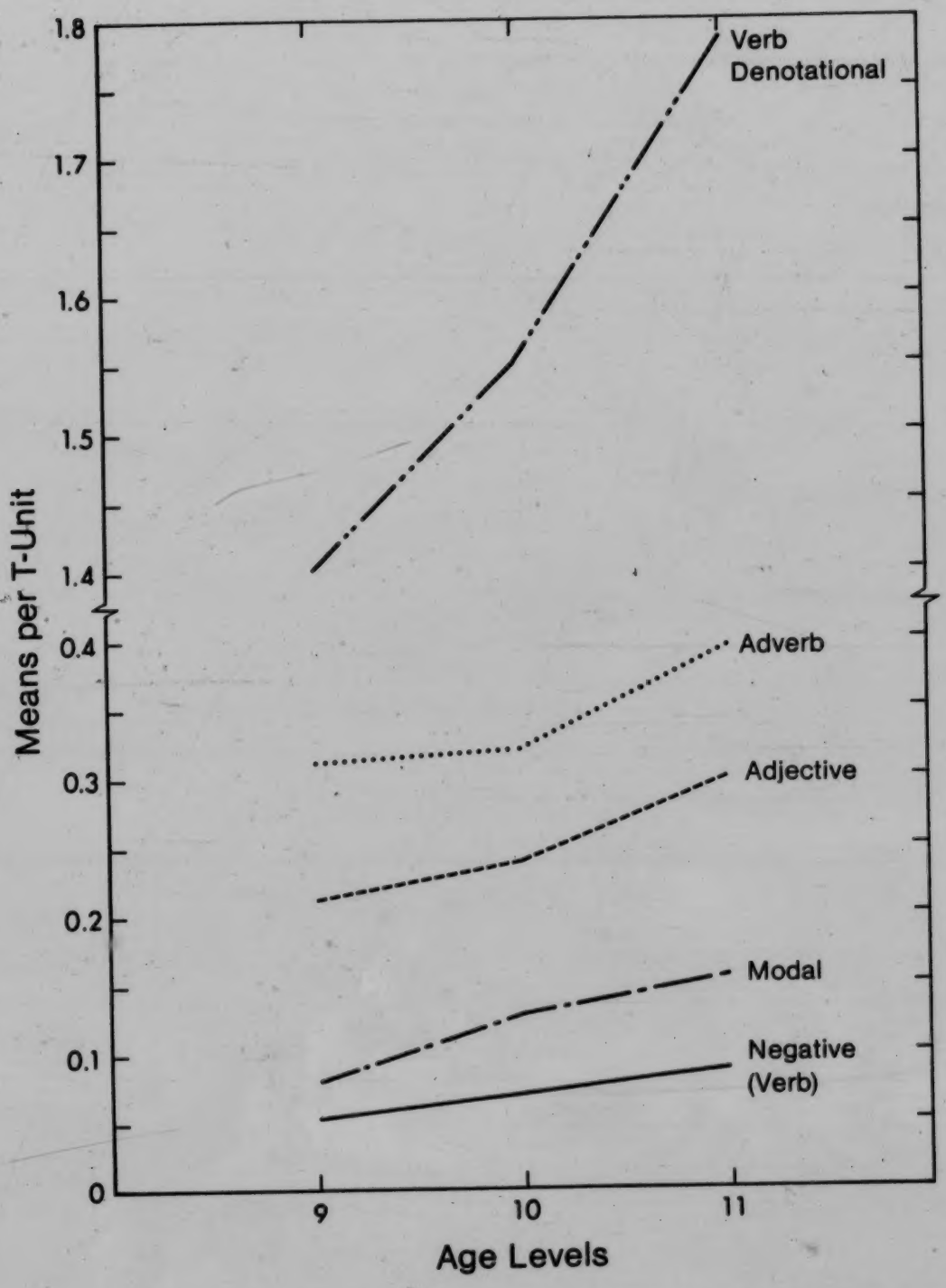

Figure 4-2 Denotational Information Which Increased Significantly Over Age Levels

adjectives in prenominal position were included in this category. A significant increase in the use of prenominal adjectives over grades four to twelve had been noted by Hunt (1965) with most of the increase occurring by grade eight. Hunt considered that the increased use of the prenominal adjective was likely due in large measure to the older students' ability to employ adjectives to convey the same information which younger students often wrote in basic T-units, adjective clauses and adjective phrases. Another factor suggested, but given little weight by Hunt, was the possibility that older students come up with more attributes for nouns. In the present study, it seems likely that both factors were operative. The second factor gains some credence from the fact that the number of different adjectives used exclusively by the eleven year olds was nearly double the number used solely by either the nine or ten year olds. For example, the nouns idea and road were used by all three age groups but only at the eleven year old level were adjectives employed with them (brilliant idea, busy road). This may also reflect the gradual move with age from expressive to transactional writing involving greater explicitness which was described by Britton and others (1975).

Between ages nine and eleven, adverbs per T-unit increased significantly with most of the gain taking place from ages ten to eleven. However, the density of adverbs in relation to the total number of words written by the children showed approximately equal gains at age ten and age eleven. Later in this chapter, significant increases over ages nine to eleven in the number of subordinate clauses per T-unit and in the number of alternate syntactic structures

are discussed (see Table IV-11 and Table IV-21, respectively). These increases may account for much of the growth of adverbs per T-unit at the eleven year level. In addition, the fact that the proportion of total words which were adverbs increased at age ten and eleven might indicate a heightened awareness of the relationships signified by adverbs of time, manner, and condition. Hunt (1965), in examining the frequency of occurrence of adverbs and adverb phrases combined, found that those of manner grew significantly while those of time, place, and motion increased only slightly from grades four to eight. He indicated that the limited growth of the latter was possibly, to some extent, a result of a decrease in the proportion of narrative writing done at the higher grade level.

Negative information attached to the verb increased significantly on a per T-unit basis over ages nine to eleven. The density of these negatives in relation to total words written was highest at age ten and was marginally lower at age eleven. Increasing subordination and alternate syntactic structures per T-unit might then largely explain the growth in negatives per T-unit at age eleven. There may also be an increased consciousness at the higher age levels of the contrast existing between negative and affirmative events. Such a possibility could be indicated by the fact that twelve nine year old students did not use negatives attached to the verb while only three of the eleven year old students failed to do so.

Verb denotational information per T-unit increased significantly from ages nine to eleven and from ages ten to eleven. These gains might be expected since each of the types of denotational

information which composed this category showed growth over these ages. Increases were also noted across ages nine to eleven which approached significance for grand total denotational information ($p = .056$) and to a lesser degree for noun denotational information ($p = .082$). Increases in subordination and greater use of alternate syntactic structures within T-units likely contribute, to a considerable degree, to the growth per T-unit of the above three categories of denotational information.

Of all the categories of denotational information studied, only two types registered smaller amounts per T-unit at age eleven than at age nine. Expletives occurred so infrequently that the decrease amounted to about one less expletive in every two hundred and fifty T-units. Hunt (1965) had found that the incidence of coordinating conjunctions between main clauses declined significantly between grade four and grade eight. The decline was not completely equalized by increases at the eighth grade of coordinating conjunctions within main clauses and subordinating conjunctions. This finding may provide an explanation for the fact that fewer connectives were used at the higher age levels than at age nine in the present study.

Hypothesis 2(b):

> There will be no significant differences over age levels nine, ten, and eleven in the amounts of relational information per T-unit.

This hypothesis was not rejected for complements, main verbs, total relational information, and direct and indirect objects. It was rejected for the use of subjects as the probability of difference for

this variable reached the five percent level of significance (see Tables IV-7, IV-8).

Discussion

The means for total amounts of relational information reported in Table IV-9 show increases at ages ten and eleven for each type of information. These gains were largely due to progressive increases in the mean number of words written at the two higher age levels. It is evident from these means that subject-verb and subject-verb-object patterns were the most prevalent in the children's writing. Patterns which involved complements and indirect objects were much less common. At the nine and ten year levels the use of indirect objects averaged to less than one per child.

When relational information was calculated on a per T-unit basis, only in the case of subjects did a significant increase occur. This increase took place between the nine and eleven year old levels and was probably, in large measure, a result of the greater number of subordinate clauses per T-unit which were employed by the ten and eleven year old students. Since subordinate clauses contain both a subject and a finite verb, it might be expected that verbs per T-unit would show significant gains at ages ten and eleven. However, this increase in verbs per T-unit through subordination was offset by the fact that the nine year old students used a greater number of verbs in coordinate predicates per T-unit than either the ten or eleven year old students (see Table IV-10). The verbs being referred to are all those in coordinate predicates except for the initial verb in such predicates (He took off his boots and left them and went fishing).

TABLE IV-7

SUMMARY OF A TWO-WAY ANALYSIS OF VARIANCE OVER AGE AND SEX FOR RELATIONAL INFORMATION PER T-UNIT

		Means		Variances				
Variable	Age	Boys	Girls	Boys	Girls	F-ratio		p
Subject	9	1.278	1.277	.049	.056	Age	4.283	.016
	10	1.284	1.386	.020	.014	Sex	3.593	.061
	11	1.352	1.444	.029	.018			
Direct Object	9	.608	.580	.036	.044	Age	.794	.455
	10	.542	.566	.056	.027	Sex	.408	.525
	11	.639	.575	.018	.028			
Indirect Object	9	.025	.048	.001	.002	Age	.223	.800
	10	.033	.035	.002	.002	Sex	1.140	.288
	11	.040	.041	.002	.002			
Complement	9	.068	.068	.003	.004	Age	.534	.588
	10	.105	.075	.037	.005	Sex	.157	.693
	11	.067	.076	.004	.004			
Main Verb	9	1.524	1.554	.139	.121	Age	1.248	.291
	10	1.450	1.562	.044	.035	Sex	.751	.388
	11	1.607	1.597	.037	.039			
Total Relational	9	3.503	3.524	.482	.536	Age	1.936	.149
	10	3.415	3.583	.164	.143	Sex	.501	.481
	11	3.706	3.733	.181	.192			

TABLE IV-8

SCHEFFE COMPARISON OF MEANS FOR RELATIONAL INFORMATION OVER AGES

	Age 9-10	9-11	10-11
Subject		**	

**.05 level of significance.

TABLE IV-9

MEANS AND STANDARD DEVIATIONS OVER AGE LEVEL FOR RELATIONAL INFORMATION

Variable	Age	Mean	Standard Deviation
Subject	9	29.083	13.688
	10	33.056	16.425
	11	35.472	12.489
Direct object	9	13.250	6.631
	10	14.250	8.867
	11	15.333	6.429
Indirect object	9	.889	1.074
	10	.944	1.177
	11	1.167	1.572
Complement	9	1.528	1.322
	10	1.750	1.862
	11	1.778	1.618
Main verb	9	34.861	16.038
	10	38.250	21.219
	11	40.694	14.727
Total relational	9	79.583	36.262
	10	87.972	46.362
	11	94.444	33.863

TABLE IV-10

NUMBER OF VERBS IN COORDINATE PREDICATES PER T-UNIT

	Age 9	Age 10	Age 11
Verbs per T-unit	.297	.222	.251

The occurrence of these verbs accounts for most of the disparity between the number of subjects and main verbs per T-unit at each age level.

Hypothesis 2(c):

> There will be no significant differences over age levels nine, ten, and eleven in the amounts of contextual information per T-unit for:
>
> i. topics and ordering
> ii. referential information
> iii. logical information.

2(c)i This hypothesis was rejected for the number of topics, the number of subordinates, and the number of topics at the first, tenth, eleventh, and fourteenth orders. The hypothesis was not rejected for the number of different topics or the number of topics occurring at those orders not indicated above (see Tables IV-11, IV-14).

2(c)ii This hypothesis was rejected for total referential information but was not rejected for pronoun, repetition, synonym, class inclusion, inclusion, and formal repetition (see Tables IV-12, IV-14).

2(c)iii This hypothesis was rejected for temporal conjunction. It was not rejected for condition, conjunction, disjunction, temporal disjunction, contrast, comparison, and total logical information (see Tables IV-13, IV-14).

Discussion

A topic was basically defined as information about something (boat, boys, etc.) contained in the noun phrase to the left of the main verb. Each clause whether main or subordinate will have a topic

TABLE IV-11

SUMMARY OF A TWO-WAY ANALYSIS OF VARIANCE OVER AGE AND SEX FOR TOPICS AND ORDERING INFORMATION PER T-UNIT

		Means		Variances				
Variable	Age	Boys	Girls	Boys	Girls	F-ratio		p
Number of topics	9	1.266	1.286	.047	.063	Age	4.868	.010
	10	1.303	1.395	.026	.017	Sex	4.046	.047
	11	1.360	1.457	.024	.017			
Number of different topics	9	.435	.427	.015	.010	Age	1.750	.179
	10	.502	.485	.053	.020	Sex	.042	.837
	11	.478	.485	.021	.015			
Number of subordinates	9	.271	.254	.038	.041	Age	4.787	.010
	10	.284	.353	.029	.009	Sex	2.560	.113
	11	.330	.422	.018	.011			
First order	9	.265	.248	.079	.063	Age	3.910	.023
	10	.144	.165	.069	.057	Sex	.030	.864
	11	.118	.091	.041	.023			
Second order	9	.342	.236	.096	.083	Age	.594	.554
	10	.269	.159	.090	.044	Sex	.794	.375
	11	.236	.298	.089	.135			
Third order	9	.199	.224	.065	.084	Age	3.031	.053
	10	.300	.448	.087	.088	Sex	1.149	.286
	11	.292	.291	.065	.081			
Fourth order	9	.109	.126	.009	.021	Age	1.012	.367
	10	.140	.131	.020	.015	Sex	.086	.770
	11	.161	.180	.037	.056			
Fifth order	9	.099	.103	.004	.013	Age	1.965	.145
	10	.055	.089	.001	.004	Sex	3.104	.566
	11	.086	.126	.005	.009			
Sixth order	9	.073	.082	.002	.003	Age	.097	.908
	10	.071	.077	.005	.004	Sex	.004	.951
	11	.087	.074	.006	.003			
Seventh order	9	.038	.064	.002	.004	Age	1.373	.258
	10	.068	.063	.005	.001	Sex	.222	.638
	11	.075	.067	.003	.002			

TABLE IV-11 (Continued)

Variable	Age	Means		Variances		F-ratio		p
		Boys	Girls	Boys	Girls			
Eighth order	9	.067	.078	.006	.007	Age	.268	.766
	10	.079	.072	.005	.009	Sex	.116	.734
	11	.096	.076	.007	.006			
Ninth order	9	.038	.055	.006	.007	Age	.232	.794
	10	.048	.037	.003	.001	Sex	.452	.503
	11	.044	.060	.002	.003			
Tenth order	9	.013	.024	.001	.001	Age	3.866	.024
	10	.048	.027	.004	.001	Sex	.784	.378
	11	.053	.040	.004	.001			
Eleventh order	9	.009	.015	.000	.001	Age	6.090	.003
	10	.024	.019	.001	.000	Sex	.044	.833
	11	.041	.037	.002	.001			
Twelfth order	9	.009	.010	.000	.000	Age	2.518	.086
	10	.023	.024	.003	.001	Sex	.002	.969
	11	.025	.025	.001	.001			
Thirteenth order	9	.004	.012	.000	.001	Age	1.709	.186
	10	.016	.024	.001	.002	Sex	2.404	.124
	11	.014	.028	.001	.002			
Fourteenth order	9	.002	.006	.000	.000	Age	4.148	.019
	10	.009	.013	.000	.000	Sex	.765	.384
	11	.021	.027	.003	.002			

TABLE IV-12

SUMMARY OF A TWO-WAY ANALYSIS OF VARIANCE OVER AGE AND SEX FOR REFERENTIAL INFORMATION PER T-UNIT

		Means		Variances				
Variable	Age	Boys	Girls	Boys	Girls	F-ratio		p
Pronoun	9	1.178	1.101	.067	.095	Age	.488	.615
	10	1.175	1.192	.263	.034	Sex	.130	.720
	11	1.215	1.210	.042	.093			
Repetition	9	.533	.706	.082	.128	Age	1.122	.330
	10	.616	.795	.112	.096	Sex	6.153	.015
	11	.677	.756	.060	.064			
Synonym	9	.130	.119	.008	.005	Age	2.254	.110
	10	.159	.170	.013	.012	Sex	.121	.728
	11	.160	.179	.009	.012			
Class inclusion	9	.064	.069	.003	.004	Age	1.928	.151
	10	.069	.102	.004	.005	Sex	1.107	.295
	11	.095	.093	.003	.003			
Inclusion	9	.007	.022	.000	.001	Age	1.714	.185
	10	.023	.039	.002	.003	Sex	1.302	.257
	11	.029	.023	.001	.001			
Formal repetition	9	.046	.036	.004	.002	Age	1.109	.334
	10	.050	.067	.005	.002	Sex	.063	.802
	11	.045	.046	.001	.001			
Total referential	9	1.958	2.056	.160	.352	Age	3.372	.038
	10	2.020	2.366	.229	.109	Sex	4.469	.037
	11	2.221	2.308	.090	.192			

TABLE IV-13

SUMMARY OF A TWO-WAY ANALYSIS OF VARIANCE OVER AGE AND SEX FOR LOGICAL INFORMATION PER T-UNIT

		Means		Variances				
Variable	Age	Boys	Girls	Boys	Girls	F-ratio		p
Condition	9	.049	.053	.004	.008			
	10	.044	.088	.002	.005	Age	1.735	.181
	11	.073	.087	.003	.004	Sex	2.588	.111
Conjunction	9	.669	.650	.185	.113			
	10	.470	.492	.098	.071	Age	3.052	.052
	11	.641	.493	.052	.047	Sex	.671	.415
Disjunction	9	.010	.009	.001	.000			
	10	.008	.006	.000	.000	Age	.336	.715
	11	.011	.012	.000	.001	Sex	.020	.887
Temporal conjunction	9	.026	.018	.002	.001			
	10	.074	.055	.006	.002	Age	4.796	.010
	11	.034	.063	.003	.006	Sex	.005	.946
Temporal disjunction	9	.292	.227	.038	.020			
	10	.207	.214	.036	.044	Age	.805	.450
	11	.207	.243	.015	.017	Sex	.057	.813
Contrast	9	.033	.039	.002	.003			
	10	.044	.089	.003	.008	Age	2.720	.071
	11	.056	.032	.002	.001	Sex	.615	.435
Comparison	9	.004	.001	.000	.000			
	10	.003	.020	.000	.001	Age	2.663	.075
	11	.014	.011	.001	.000	Sex	.918	.340
Total logical	9	1.084	1.008	.228	.175			
	10	.850	.965	.085	.066	Age	1.495	.229
	11	1.049	.945	.063	.093	Sex	.110	.741

TABLE IV-14

SCHEFFE COMPARISON OF MEANS FOR TOPICS, REFERENTIAL AND LOGICAL INFORMATION OVER AGES

Variable	Age 9-10	9-11	10-11
No. of topics		**	
No. of subordinates		**	
First order		**	
Tenth order		**	
Eleventh order		**	*
Fourteenth order		**	
Total referential		*	
Temporal conj.	**		

** .05 level of significance
* .10 level of significance

and if a clause has a compound subject there will be two topics. The total number of compound subjects that occurred at ages nine, ten, and eleven were four, ten, and twelve, respectively.

Between ages nine and eleven there was a significant increase in the number of topics per T-unit written by the children. Since the incidence of compound subjects was minimal, this growth must have been almost entirely due to a greater placement of topics in subordinate clauses. This conclusion is supported by the finding that there was a significant increase per T-unit across ages nine to eleven in the number of subordinates (topics which occurred in subordinate clauses).

The number of subordinates per T-unit was virtually equivalent to the number of subordinate clauses per T-unit as there were only two instances of compound subjects in subordinate clauses. Loban (1976) and Hunt (1965) both found greater numbers of subordinate clauses per T-unit with increases in grade level and, in Table IV-15, their figures are compared with the number of subordinates per T-unit in the present study. The fact that the ten and eleven year old students used more subordinate clauses was previously given as a partial explanation for the gains noted for certain types of denotational information. With reference to topics, it seems that the older students chose more frequently to subordinate their topics than did the nine year old students.

In each child's discourse, the first topic written was assigned to the first order. Then, the second topic that the child wrote was either classified as belonging to the first order if it referred directly to the same topic (old information) or to a second

TABLE IV-15

COMPARISON OF SUBORDINATE CLAUSES PER T-UNIT

Cameron (Age 9)	Loban (Grade 4)*	Hunt (Grade 4)
.26	.38 .19	.30
Cameron (Age 10)	Loban (Grade 5)	
.32	.35 .21	
Cameron (Age 11)	Loban (Grade 6)	
.38	.40 .29	
		Hunt (Grade 8)
		.40

*The first result is for Loban's High group and the second result is for his Random group.

order if it did not (new information). Using the old-new dichotomy as a criterion, each succeeding topic was labelled according to whether it belonged to a previous order or to a new order. The total number of orders in the child's discourse was therefore equivalent to the number of different topics introduced.

The mean number of topics written at each order by the three age groups is diagrammed in Figure 4-3. It can be seen that topics occurred more frequently at each of the first three orders than at any succeeding orders. This resulted from the fact that the key (most frequent) topic was almost always introduced at either the first, second, or third order (see Table IV-16). Most nine year old subjects introduced their key topic at the first and second order while a majority of ten and eleven year old students introduced their key topics after the second order. This largely explains the significant decrease found over ages nine to eleven in the number of topics per T-unit occurring at the first order. The older age groups often provided some frame of reference at the beginning of their narratives before they stated the key topic, as in the following example:

> I just saw a film called the Stowaway. It was about a boy named Danny who got up at 4:00 in the morning to stowaway on the Jean Francis.

Nine year old students frequently began their narratives with the key topic, providing no such introduction. e.g. A boy was asleep and he woke up and looked at the clock. These differences in narrative openings may indicate that at the higher age levels there was an increased awareness of the need to be explicit in order to avoid possible confusion on the part of the potential reader.

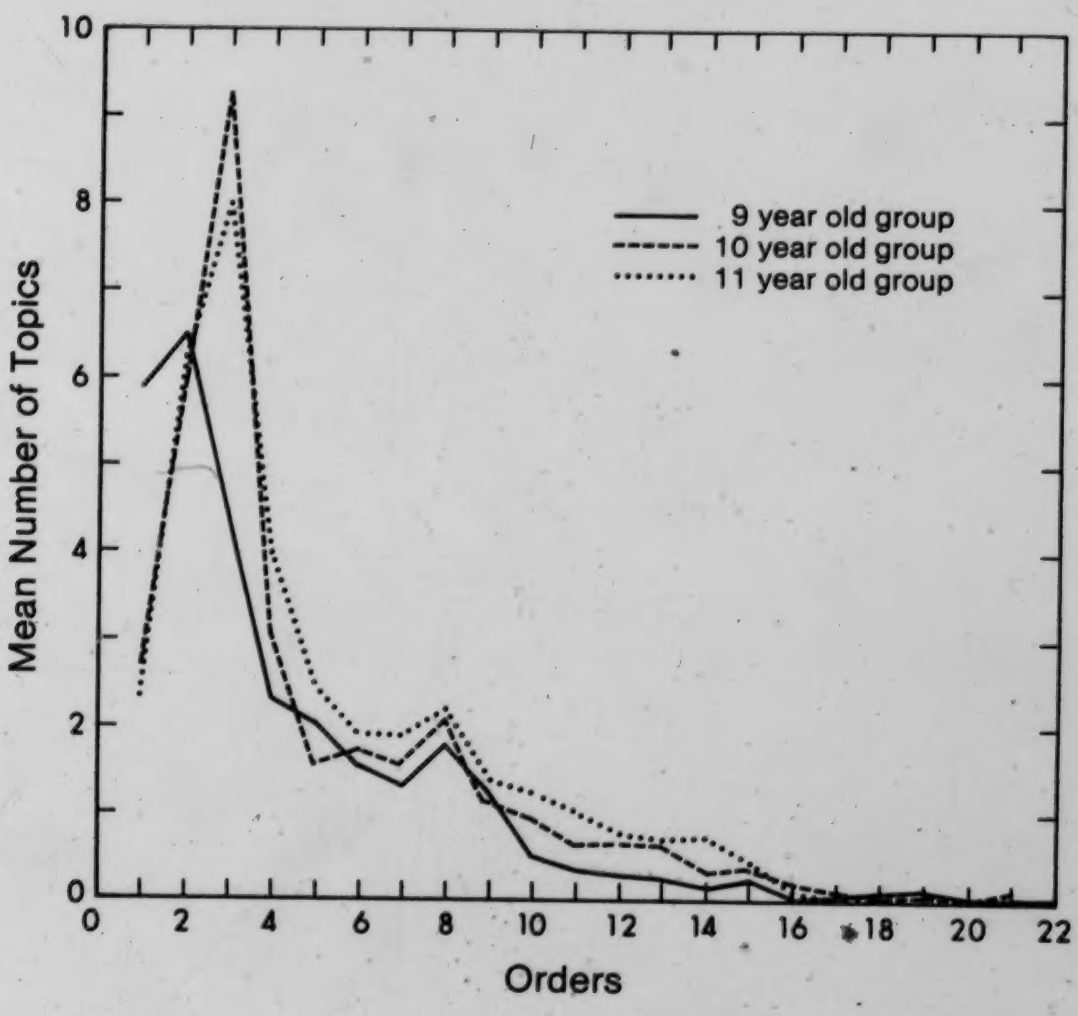

Figure 4-3 Ordering of Topics Over Age Levels

TABLE IV-16

PLACEMENT OF KEY TOPICS BY ORDER

	Age 9	Age 10	Age 11
First Order	15	6	3
Second Order	12	8	11
Third Order	8	18	15
Fourth Order	1	3	6
Fifth Order	0	0	1
Sixth Order	0	1	0

There was a significant increase over ages nine to eleven in the number of topics per T-unit written at the tenth, eleventh, and fourteenth order. This increase was also significant between ages ten and eleven at the eleventh order. These results were in large measure accounted for by a significant increase in the number of different topics (orders) written over ages nine to eleven (see Tables IV-17, IV-18).

TABLE IV-17

SUMMARY OF A TWO-WAY ANALYSIS OF VARIANCE OVER AGE AND SEX FOR NUMBER OF DIFFERENT TOPICS (ORDERS)

		Means		Variances				
Variable	Age	Boys	Girls	Boys	Girls	F-ratio		p
Number of Different Topics	9	8.389	10.278	7.075	15.977	Age	3.822	.025
	10	10.278	11.333	15.742	17.529	Sex	2.627	.108
	11	11.444	11.889	10.144	12.222			

TABLE IV-18

SCHEFFE COMPARISON OF MEANS FOR NUMBER OF DIFFERENT TOPICS (ORDERS) OVER AGES

	Age 9-10	Age 9-11	Age 10-11
Number of Different Topics		**	

**.05 level of significance.

The number of children who placed topics at each of the orders from the seventh to the fourteenth decreased from ages eleven to ten

and again from ages ten to nine (see Figure 4-4). It may be, that at higher age levels, children are able to elaborate more through the recall and inclusion of a greater number of different topics in their narratives.

The average number of topics placed at each order was very similar in each of the three age groups (see Table IV-19). This finding helps to explain why the number of different topics per T-unit did not change significantly with age.

The use of certain types of referential information between topics indicated that the topics belonged to the same order. Topics were viewed as being the same if they were connected by a pronoun, a repetition, or a synonym. Thus all of the topics in the following example would belong to the same order:

> Two teenagers drove up in a car. They saw the boy in the stream. The teenagers wanted the boy's golfballs. The two guys saw his boots on the bank.

The other kinds of referential information that occurred between topics signified relationships across orders rather than within them. These were class inclusion, inclusion, formal repetition, and derivation. They are illustrated in the order given by a continuation of the preceding example:

> And so one guy threw the boots in the stream. That made the boy mad. Then another guy came on a motorbike. The teens can be trying years.

Each of the topics in this case belongs to a different order. It should be noted that all referential information within the discourse was tallied and not just that which was within the topics.

The amounts of referential information used per T-unit over

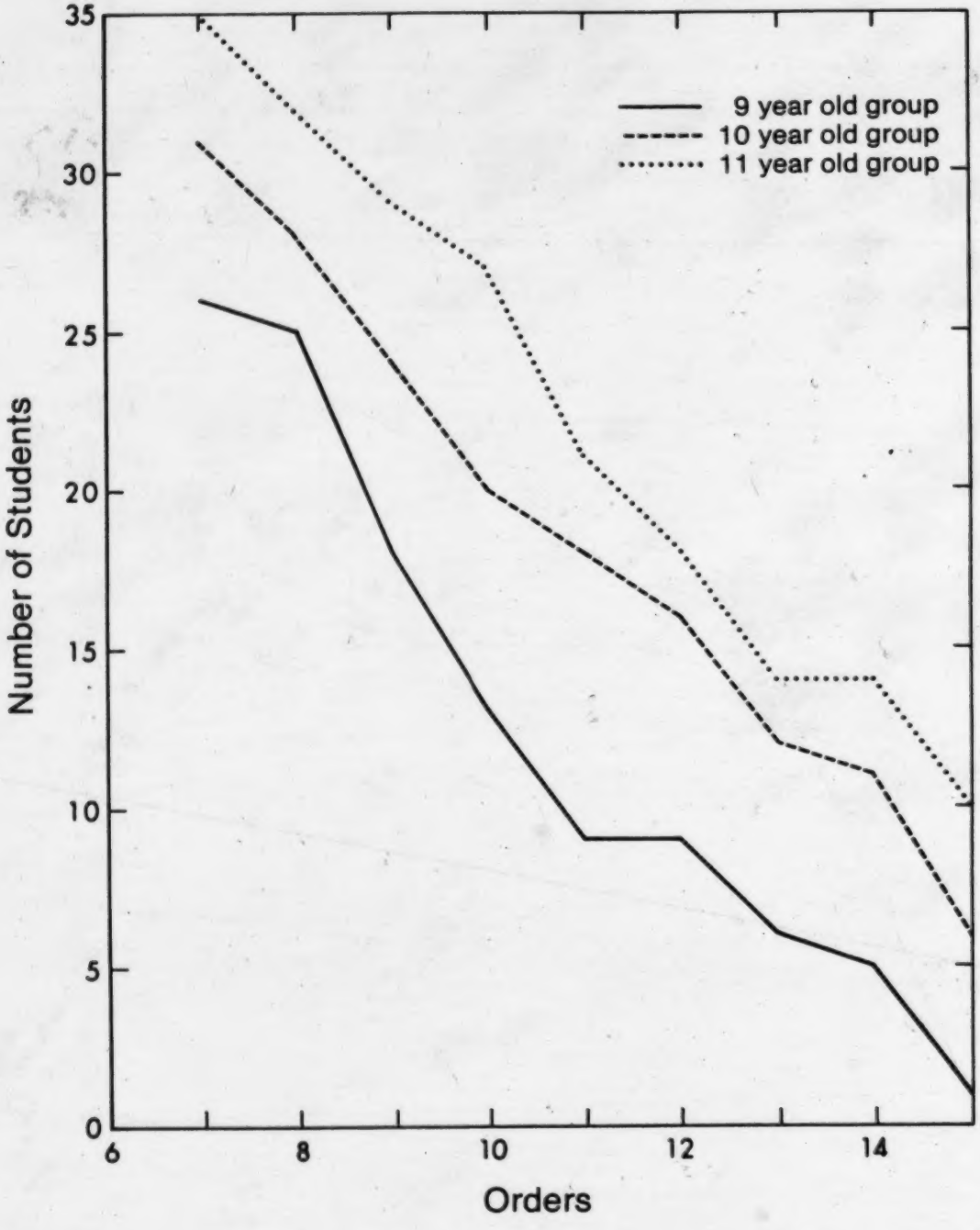

Figure 4-4 Students Writing at 7th to 15th Order

TABLE IV-19

SUMMARY OF A TWO-WAY ANALYSIS OF VARIANCE OVER AGE AND SEX FOR NUMBER OF TOPICS PER ORDER

		Means		Variances			
Variable	Age	Boys	Girls	Boys	Girls	F-ratio	p
Topics per order	9	3.057	3.200	.522	1.168	Age .016	.984
	10	3.109	3.074	1.621	.574	Sex .247	.620
	11	3.042	3.203	.563	.805		

the three age levels is graphed in Figure 4-5. Derivation is not included as only three instances were recorded which did not permit an analysis of variance to be carried out.

The ten and eleven year old groups used more of each type of referential information than did the nine year old group. Although on their own none of these differences were significant, together they resulted in a significant increase for the total amount of referential information per T-unit between ages nine and eleven. This increase in total referential information may tie in with the previously discussed gain in the number of topics per T-unit across the same ages. As the older students subordinated more topics within T-units, it might be expected that the amount of referential information relating these topics would also increase.

Pronouns were clearly the most frequent type of referential information used to relate topics of the same order. It is of interest to note that seven of the nine year old subjects wrote a pronoun as their initial instance of the key topic, possibly assuming the referent was known to the reader. e.g. He woke up and went to a ship. None of the ten and eleven year old students wrote in this manner.

After pronouns and repetitions, the use of the other types of referential information dropped markedly. The content and presentation of the stimulus for writing and the nature of the writing task (narrative) might be expected to have some influence on the amounts used of certain types of referential information. Synonyms did appear to be affected by the difference in films. The Huntsman was not

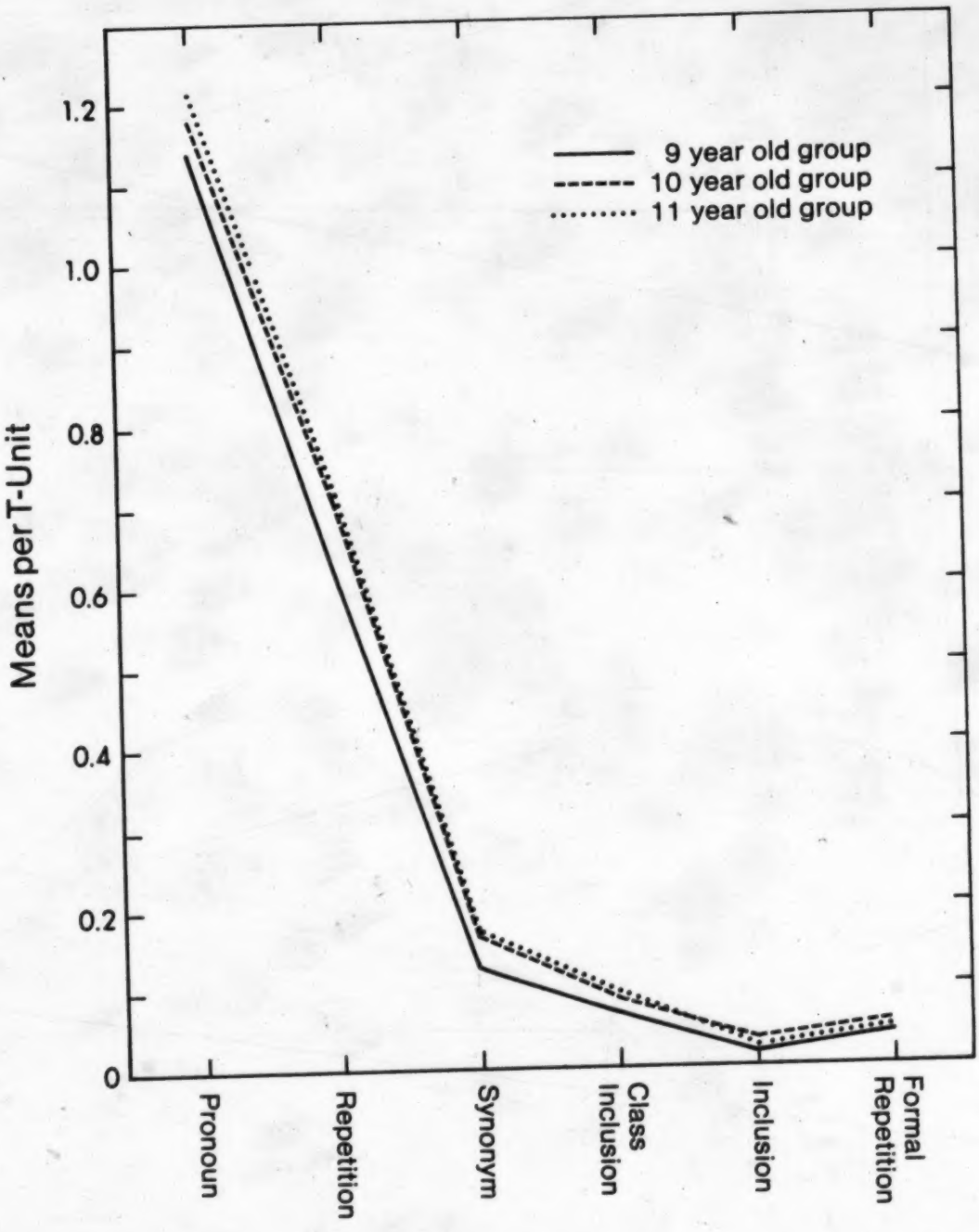

Figure 4-5 Referential Information per T-Unit Over Age Levels

narrated, while in The Stowaway, the narrator used a number of synonyms. e.g. schooner-ship, boat-dory. Those children who viewed the latter film used noticeably more synonyms than those who saw the former one.

Another type of organization within written discourse is provided by logical information. Logical information refers to the relationships expressed through the use of connectives. These relationships provide links not only between topics but also between comments and topic/comments. e.g. When [(the boy) and (the sailor) were catching fish] [the fog (rolled in) and (hid the ship)].

Figure 4-6 shows the amount of different types of logical information per T-unit used by each age group. Spatial connectives are not reported as there were too few instances to allow an analysis of variance to be done.

Ten and eleven year old students made more use of temporal conjunction than nine year old students and this difference was significant at the ten year old level. The students most frequently used the connectives when and while to indicate temporal conjunction or the occurrence of one event at the same time as another event. No significant differences were found for the other types of logical information.

Conjunction and temporal disjunction were by far the commonest logical relationships used by the children. Both of these categories were employed the most by the nine year old group. The decrease in the use of conjunction at the ten year old level closely approached the level of significance ($p = .052$). The conjunction category

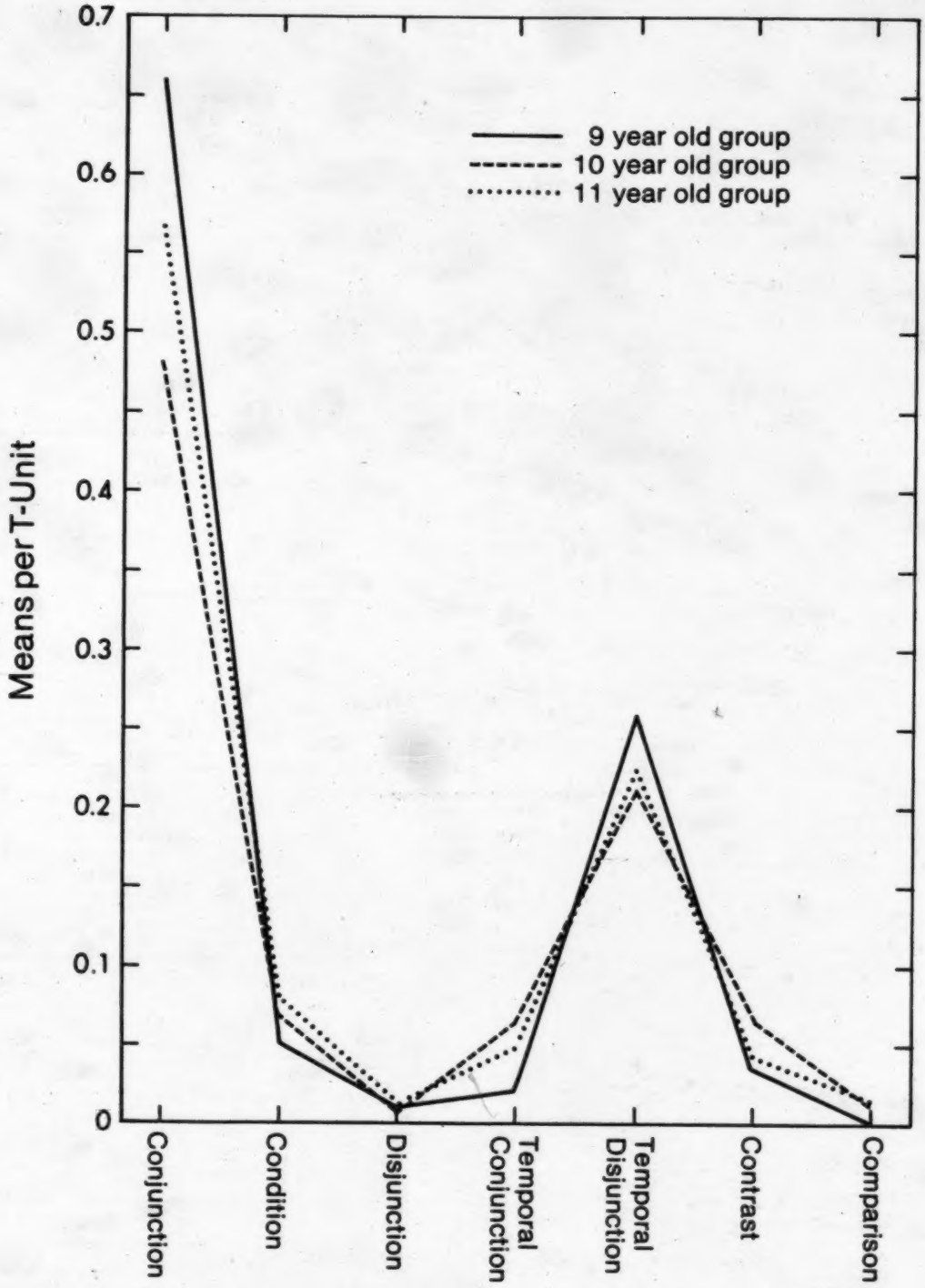

Figure 4-6 Logical Information Per T-Unit Over Age Levels

involved the linking of two things in equivalence and was mainly expressed by the connective and. Hunt (1965) had found a significant drop over grades four to twelve in the use of and as a coordinator between main clauses. A similar trend in the present study probably accounts, to a large extent, for the decreased use of the conjunction category. The use of and as a coordinator between T-units went from two hundred and thirty-one occurrences at age nine to one hundred and sixty-one occurrences at age ten.

In addition to temporal conjunction, ten and eleven year old students used more logical relationships of condition, contrast, and comparison than were used by the nine year old students. These categories, employing such connectives as but, if, because, while and like, appear to involve more complex relationships than conjunction and temporal disjunction. The children usually used then to signal temporal disjunction indicating that one event was happening before or after another event.

There seems, then, to be a movement toward the use of a greater variety of types of logical information at the older age levels. It also appears possible that the categories where usage increases at ages ten and eleven may involve more mental processing than the categories which decrease at these age levels.

The narrative character of the children's written discourse would seem to lend itself particularly to the use of the conjunction and temporal disjunction categories. If the writing had been done in some other style, such as an expository one, the incidence of the other types of logical information might well have risen.

The following two diagrams help illustrate some of the differences previously noted in the way in which topics were organized by the three age groups. In Figure 4-7, the discourse organization is more typical of the nine year old group, while the organization in Figure 4-8 is more representative of the ten and eleven year old groups. A solid line between two topics show that they belong to the same order and indicates the presence of referential information in the form of a pronoun, repetition, or synonym. The presence of class inclusion, inclusion, formal repetition, or derivation is indicated by a broken line. A zigzag line is used to show subordination. If one topic in the discourse was immediately followed by one or more topics of the same order, this is shown by their horizontal placement in the diagrams.

In comparing the written discourse of the three age groups a number of differences were observed in the organizational patterns of topics. The ten and eleven year old students typically used a greater number of both topics and different topics (orders) than the nine year old students. Placement of the key topic usually occurred at the first or second order in the discourses written by the youngest age group. At age ten and eleven the key topic appeared more often at the third and fourth order. The development of one or two major topics in addition to the key topic was also more evident in the writing of the two older age groups. The ten and eleven year old students more frequently subordinated topics than the nine year old students. All of the differences outlined above can be noted in the discourses diagrammed in Figures 4-7 and 4-8.

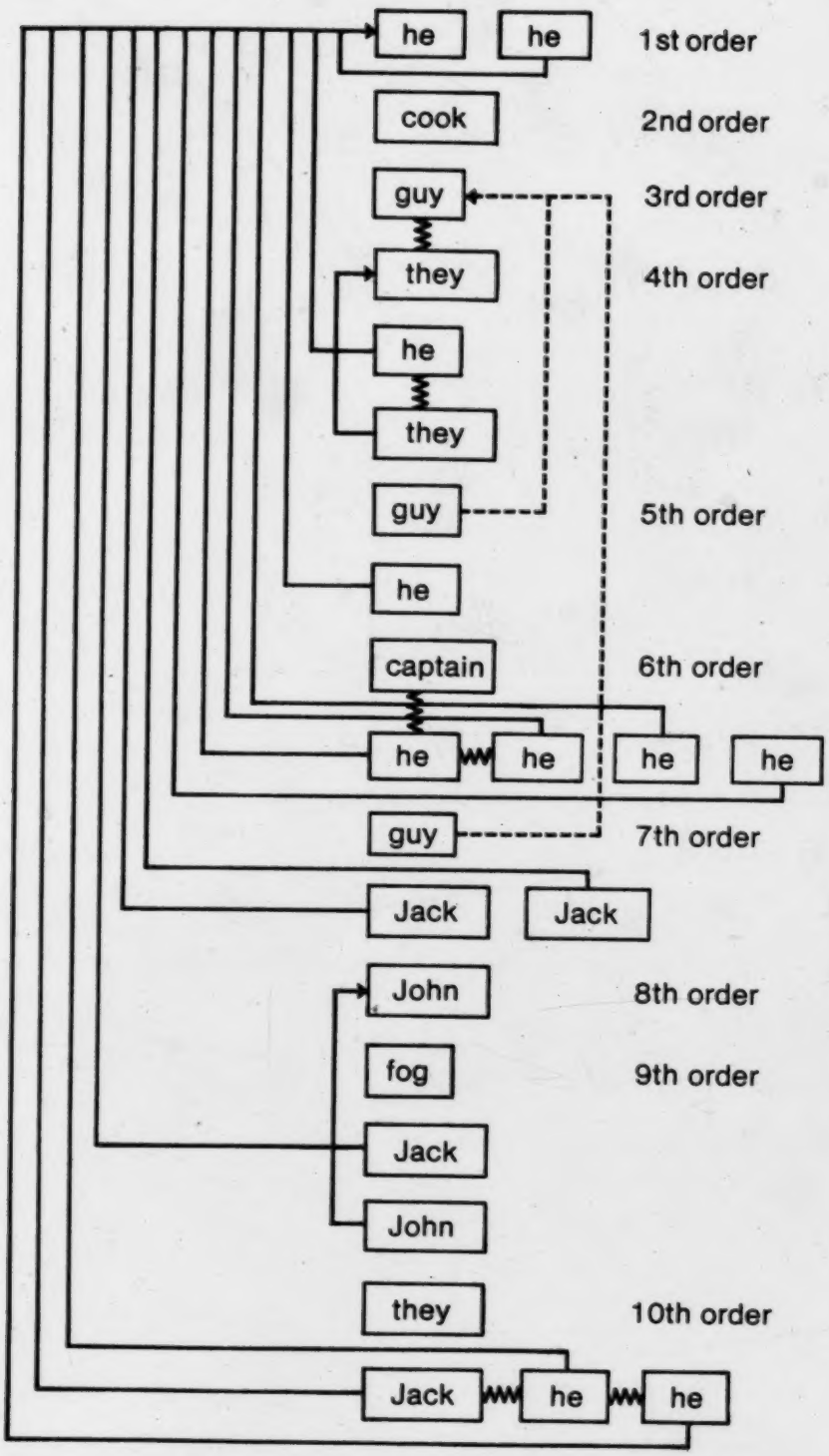

Figure 4-7 Order and Referential Relationships Among Topics (# 024, Boy, Age 9)

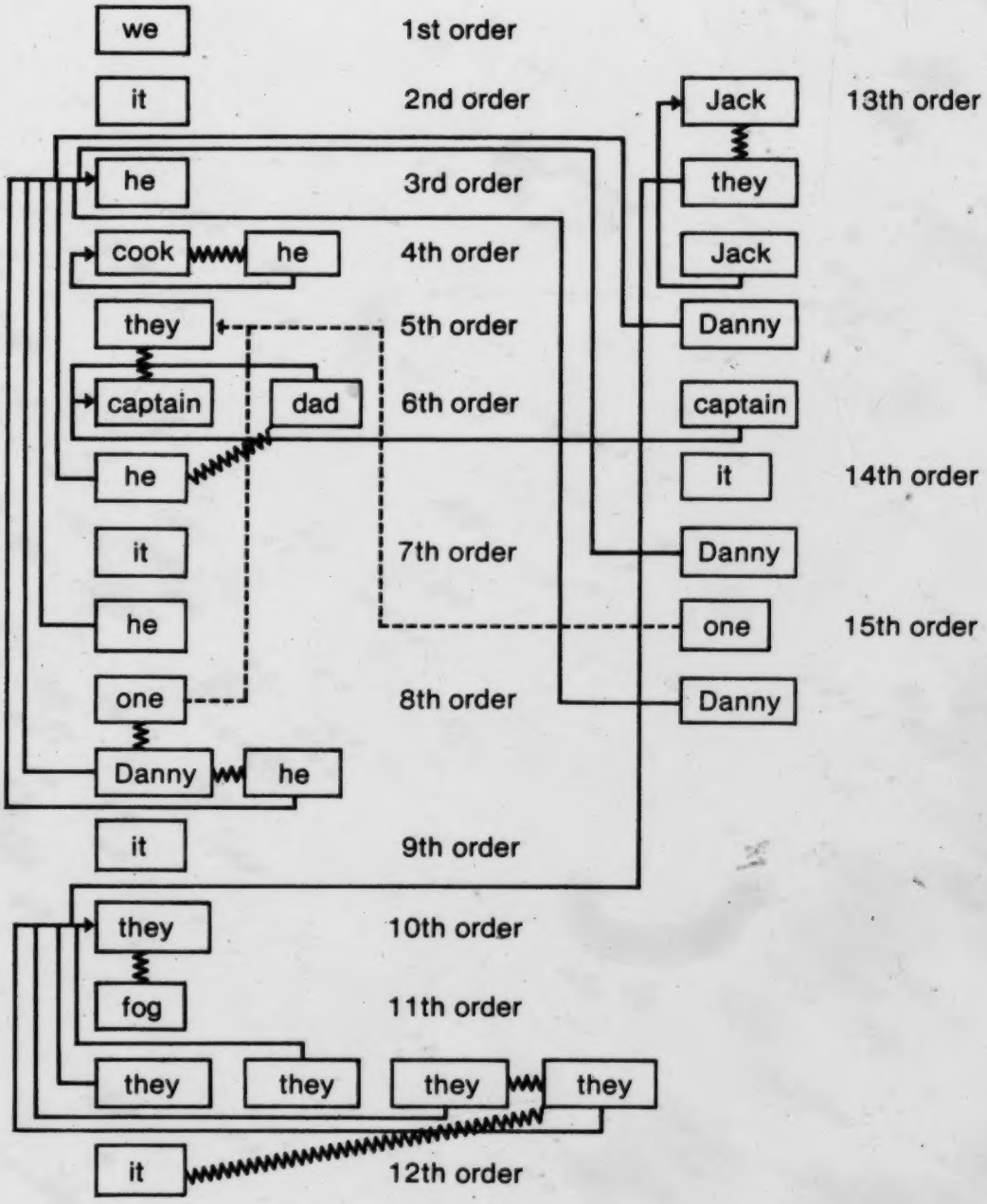

Figure 4-8 Order and Referential Relationships Among Topics
(# 091, Boy, Age 11)

III. HYPOTHESIS 3

There will be no significant differences over age levels nine, ten, and eleven for:

(a) number of basic T-units
(b) number of alternate syntactic structures per T-unit
(c) number of (i) words and (ii) denotational information per syntactic structure.

3(a) This hypothesis was not rejected (see Table IV-20).

3(b) This hypothesis was rejected for Adjective, Ing-nominative, and total alternate syntactic structures, since the probabilities of difference attained the level of significance ($p = .05$). It was not rejected for Relative Clause, That + S subject/object, WH + S subject/object, Infinitive Object, Infinitive Purpose, Adverb Expansion 1, Common Elements, WH, WH + Auxiliary/Verb, (That) + S object, (That) + S object Quote, With Phrase, Participle, Genitive, and Passive (see Tables IV-21, IV-22). There were two few occurrences to permit an analysis of variance to be conducted for Ing-nominative purpose, Comparative 1, Comparative 2, Adverb Expansion Manner + S, Adverb Expansion 2, and Appositive.

3(c)(i) (c)(ii) This hypothesis was rejected (see Tables IV-20, IV-22).

Discussion

Common Elements was the most frequently occurring alternate syntactic structure in the children's writing with the means for ages nine, ten, and eleven being 7.14, 6.28, and 7.61 respectively. The rate of occurrence for Adverb Expansion 1, the second most common syntactic structure, was considerably lower with means of 2.31, 3.28, and 3.94. Figure 4-9 graphs the frequency of usage at each age level

TABLE IV-20

SUMMARY OF A TWO-WAY ANALYSIS OF VARIANCE OVER AGE AND SEX FOR BASIC T-UNITS, ALTERNATE SYNTACTIC STRUCTURES, AND WORDS, DENOTATIONAL INFORMATION PER SYNTACTIC STRUCTURE

		Means		Variances			
Variable	Age	Boys	Girls	Boys	Girls	F-ratio	p
Words per alternate syntactic structure	9	12.425	11.328	24.121	13.552	Age 5.988	.003
	10	12.108	10.558	16.784	5.501	Sex 1.922	.169
	11	9.332	9.366	1.612	2.262		
Denotational information per alternate syntactic structure	9	12.743	11.490	24.222	15.072	Age 5.605	.005
	10	12.223	10.900	18.344	6.277	Sex 1.641	.203
	11	9.539	9.613	1.706	3.118		
Number of basic T-units	9	20.111	25.500	43.517	173.088	Age .615	.543
	10	25.111	24.556	257.635	80.850	Sex .545	.462
	11	25.667	25.556	89.413	92.498		
Total alternate syntactic structures	9	18.222	24.778	115.360	221.478	Age 3.003	.054
	10	21.778	26.444	264.654	203.909	Sex 2.204	.141
	11	29.000	29.389	162.706	132.958		

TABLE IV-21

SUMMARY OF A TWO-WAY ANALYSIS OF VARIANCE OVER AGE AND SEX FOR SYNTACTIC INFORMATION PER T-UNIT

Variable	Age	Means		Variances		F-ratio		p
		Boys	Girls	Boys	Girls			
Relative clause	9	.047	.054	.002	.003			
	10	.060	.063	.003	.003	Age	.744	.478
	11	.052	.072	.001	.002	Sex	1.177	.280
That + S subj./obj.	9	.019	.024	.001	.001			
	10	.013	.039	.001	.003	Age	.223	.800
	11	.030	.024	.001	.001	Sex	1.289	.257
WH + S subj./obj.	9	.010	.009	.000	.000			
	10	.008	.008	.000	.000	Age	1.194	.307
	11	.017	.017	.002	.001	Sex	.004	.948
Infinitive object	9	.046	.066	.006	.005			
	10	.072	.075	.009	.004	Age	.583	.560
	11	.060	.081	.005	.002	Sex	1.118	.293
Infinitive purpose	9	.029	.041	.001	.002			
	10	.018	.067	.001	.005	Age	.586	.559
	11	.042	.019	.002	.001	Sex	2.046	.156
Ing-nominative	9	.025	.044	.001	.003			
	10	.023	.045	.001	.002	Age	3.650	.029
	11	.059	.060	.003	.003	Sex	2.529	.115
Adv. expansion-1	9	.118	.094	.020	.016			
	10	.114	.156	.012	.004	Age	2.501	.087
	11	.130	.199	.012	.011	Sex	1.787	.184
Common elements	9	.281	.341	.081	.059			
	10	.211	.244	.032	.024	Age	1.742	.180
	11	.333	.255	.035	.011	Sex	.017	.898
WH	9	.022	.019	.004	.003			
	10	.018	.021	.001	.001	Age	.018	.983
	11	.011	.027	.000	.002	Sex	.449	.504
WH auxiliary/verb	9	.054	.071	.004	.003			
	10	.088	.070	.004	.004	Age	1.596	.208
	11	.070	.106	.003	.005	Sex	.886	.349

TABLE IV-21 (Continued)

Variable	Age	Means		Variances		F-ratio		p
		Boys	Girls	Boys	Girls			
(That) + S obj.	9	.037	.051	.003	.003			
	10	.053	.066	.004	.001	Age	2.074	.131
	11	.068	.080	.005	.005	Sex	1.103	.296
(That) + S obj. quote	9	.035	.026	.003	.001			
	10	.034	.020	.002	.003	Age	.067	.936
	11	.025	.028	.002	.004	Sex	.442	.507
With phrase	9	.003	.006	.000	.000			
	10	.007	.008	.000	.000	Age	.394	.675
	11	.010	.004	.000	.000	Sex	.003	.955
Adjective	9	.117	.076	.026	.008			
	10	.039	.051	.002	.003	Age	7.360	.001
	11	.161	.107	.014	.007	Sex	2.087	.152
Participle	9	.011	.011	.001	.001			
	10	.017	.012	.001	.000	Age	.250	.779
	11	.018	.015	.002	.002	Sex	.200	.656
Genitive	9	.047	.034	.008	.001			
	10	.056	.045	.014	.004	Age	.221	.802
	11	.043	.058	.002	.003	Sex	.044	.833
Total syntactic	9	.885	.976	.236	.195			
	10	.839	1.036	.080	.094	Age	4.866	.010
	11	1.152	1.170	.079	.078	Sex	2.207	.140
Passive	9	.025	.015	.001	.001			
	10	.041	.022	.003	.001	Age	1.328	.270
	11	.042	.028	.003	.001	Sex	3.109	.081

TABLE IV-22

SCHEFFE COMPARISON OF MEANS FOR SYNTACTIC INFORMATION OVER AGES

Variable	Age 9-10	9-11	10-11
Ing-Nom.		*	*
Adjective	*		**
Total syntactic		**	**
Words per syntactic structure		**	**
Denotational information per syntactic structure		**	**

** .05 level of significance
* .10 level of significance

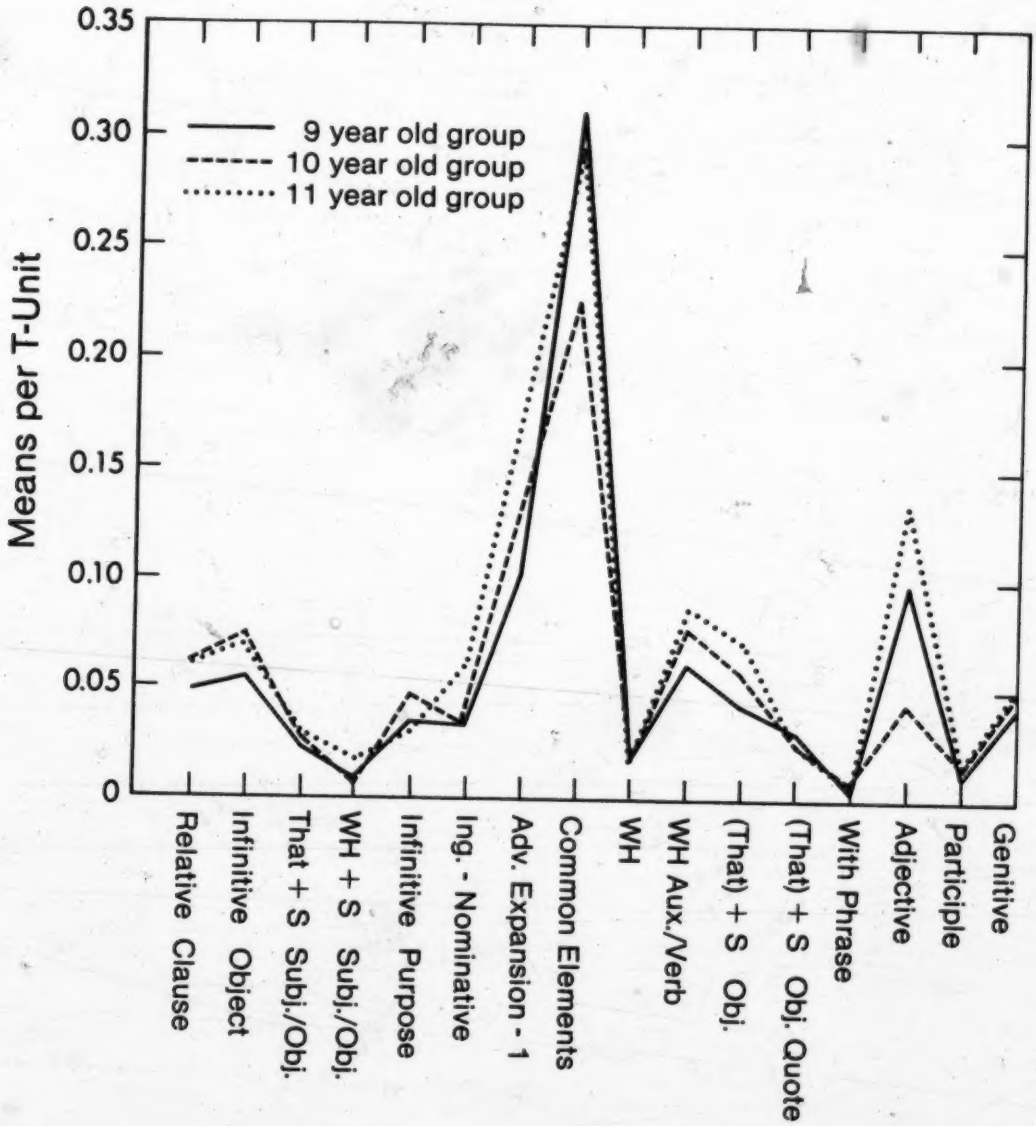

Figure 4-9 Alternate Syntactic Structures per T-Unit Over Age Levels

for the various alternate syntactic structures on a per T-unit basis (the Passive was not classified as an alternate syntactic structure). Of the sixteen structures analyzed, the eleven year old group used twelve structures more frequently than the nine year old group, and ten structures more often than the ten year old group. This resulted in the finding of a significant increase in the number of alternate syntactic structures per T-unit between ages nine and eleven and between ages ten and eleven. The increased number of alternate syntactic structures occurring at the eleven year old level may represent a shift toward greater economy in the use of words to express information. For example, the Ing-nominative could be employed to eliminate redundant noun information contained within two basic T-units (The boy looked at those dead fish and he got sick = The boy got sick from looking at those dead fish). This structure was used significantly more by the eleven year old group than by the other two age groups. The eleven year old students employed the Adjective to a significantly greater degree than did the ten year old students. The Adjective could also be used to replace two basic T-units with a single T-unit (The boy was finding golfballs. The golfballs had been lost. = The boy was finding lost golfballs). It should be noted that the Adjective structure involves only prenominal adjectives.

Although the only alternate syntactic structures which increased significantly at age eleven were the Ing-nominative and Adjective, the majority of the remaining structures did show increases at this age level. These other structures could similarly be used to express information within a single T-unit which might alternatively

have been written in two or more basic T-units. An even greater number of basic T-units could be substituted for by a single T-unit through the use of more than one alternate syntactic structure within the T-unit.

In their 1967 study, O'Donnell et al. found that the number of sentence-combining transformations per T-unit increased significantly in children's written language between grades three and five and between grades five and seven. The surface structure forms of the sentence-combining transformations examined in their study encompassed most of the alternate syntactic structures looked at in the present study. They felt it was reasonable to suppose "that at least for children, the relative density of these transformations within T-units signalizes the degree of maturity attained" (p. 50).

The number of words and the amount of denotational information per alternate syntactic structure both decreased significantly between ages nine and eleven and ages ten and eleven. These changes are graphed in Figure 4-10 and are directly related to the previously noted increases in alternate syntactic structures per T-unit. The results furnish additional support for the view that the eleven year old students' increased use of alternate syntactic structures provides for a more economical communication of information in terms of the number of words written.

IV. HYPOTHESIS 4

There will be no significant differences between boys and girls for:

(a) number of words per T-unit, incompletes, mazes per T-unit

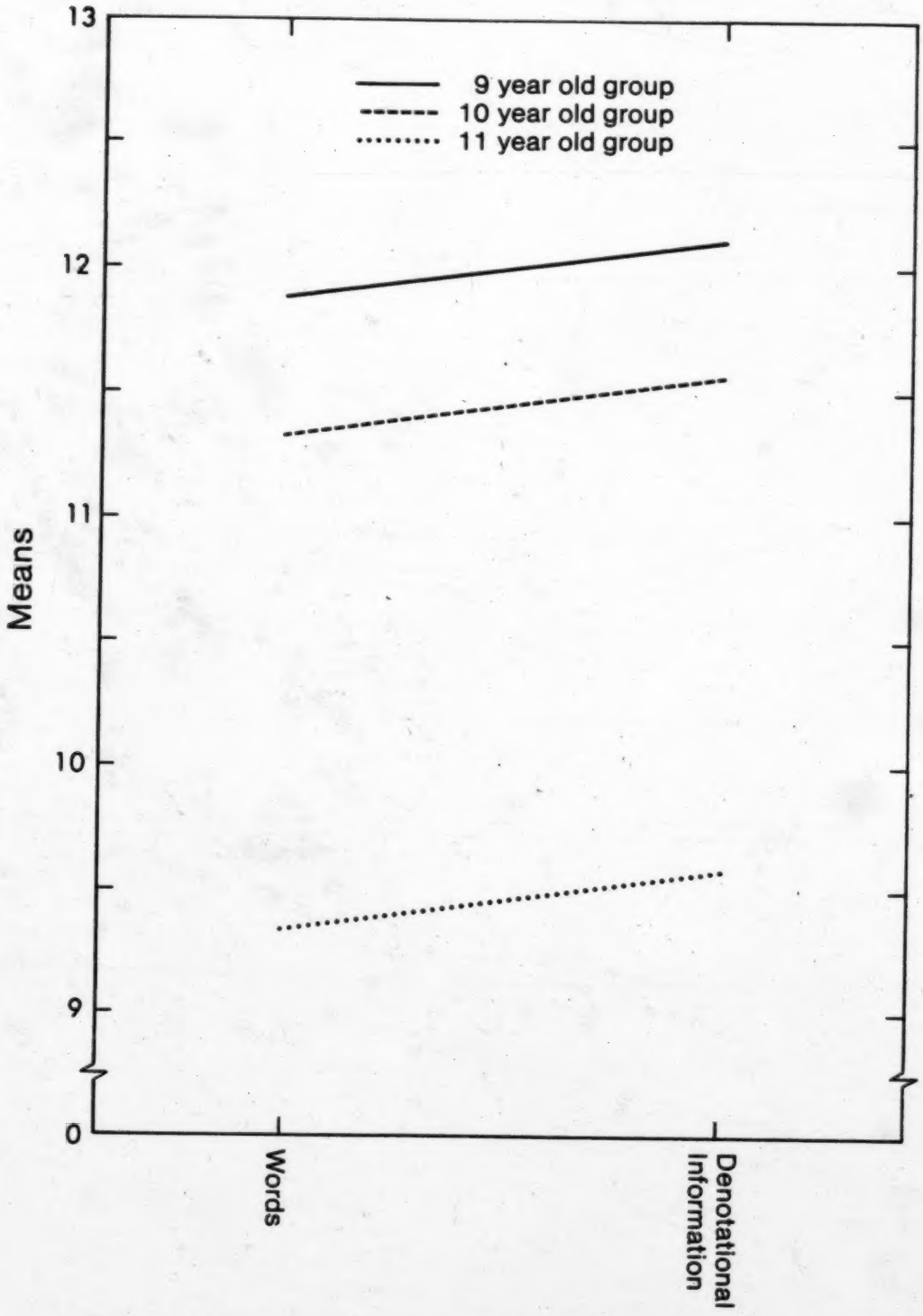

Figure 4-10 Words and Denotational Information per Alternate Syntactic Structure

(b) amount of denotational information per T-unit
(c) amount of relational information per T-unit
(d) amount of contextual information per T-unit
(e) amount of syntactic information per T-unit.

4(a) This hypothesis was not rejected (see Tables IV-1, IV-4).

4(b) This hypothesis was rejected for intensifiers (noun), total noun denotational, verbals, adverb clause of condition, and total verb denotational, since the probabilities of difference for these variables attained the five percent level of significance (see Table IV-5).

4(c) This hypothesis was not rejected (see Table IV-7).

4(d) This hypothesis was rejected for number of topics, repetition, and total referential information (see Tables IV-11, IV-12, IV-13).

4(e) This hypothesis was not rejected (see Table IV-21).

Discussion

Significant sex differences were found for eight of the eighty-three language variables which were analyzed. Table IV-23 provides the means and standard deviations for the total amounts of each of these eight variables. For each of the eight variables, the girls obtained higher scores than the boys for both the total amount and the amount per T-unit.

The girls more frequently used intensifiers with the noun than did the boys. Some writers on sex differences in oral language, while presenting no statistical data, have suggested that females more commonly use certain intensifiers such as so, quite, and such (Key, 1975; Lakoff, 1976). Bearing in mind the low incidence of intensifiers

TABLE IV-23

MEANS AND STANDARD DEVIATIONS FOR LANGUAGE VARIABLE
DIFFERENCES BETWEEN BOYS AND GIRLS

Variable	Means		S.D.	
	Boys	Girls	Boys	Girls
Intensifier (N)	.296	.685	.597	.919
Verbals	3.981	5.500	3.429	3.843
Adverb clause (condition)	.944	1.537	1.268	1.707
Noun denotational	47.889	54.574	25.716	21.289
Verb denotational	36.037	42.444	21.143	19.267
Repetition	16.704	19.222	14.481	10.671
Total referential	51.019	56.648	29.896	25.118
Number topics	30.944	34.685	15.106	14.409

in both the boys' and girls' written language, one can only speculate as to whether a similar development exists in children's written language.

There was a tendency for girls to use more referential information than boys which was mainly due to the girls' greater use of repetition. Larger amounts of both noun and verb denotational information were used by the girls. Although increases favoring the girls were noted for the majority of types of information within these two larger categories, only verbals, intensifiers with the noun, and adverb clauses of condition occurred significantly more often in the girls' written language. The girls also employed more topics per T-unit than the boys. With the exception of topics and adverb clauses of condition, the sex differences found for the language variables were largely a result of greater amounts produced by the girls at the ten year old level.

V. HYPOTHESIS 5

Hypothesis 5(a):

> There will be no significant relationships between reading achievement and denotational, relational, contextual, and syntactic information.

For nine year old students, this hypothesis was rejected for number of words, relational information, noun denotational, verb denotational, grand total denotational, syntactic information, repetition, class inclusion, total referential, number of topics, and amount of subordination (see Table IV-24).

For ten year old students, this hypothesis was rejected for number of T-units, number of words, relational information, noun

TABLE IV-24

CORRELATION COEFFICIENTS BETWEEN LANGUAGE VARIABLES AND READING ACHIEVEMENT

Variable	9 yr. old	10 yr. old	11 yr. old
Number T-units	.283	.418**	-.128
Number words	.368*	.440**	.013
Number mazes	.124	-.217	-.094
Relational information	.359*	.424**	-.114
Noun—Denotational	.356*	.443**	.138
Verb—Denotational	.405**	.401*	.079
Other—Denotational	.276	.414**	-.035
Total denotational	.366*	.438**	.028
Syntactic	.368*	.425**	.016
Passive	-.098	.261	.268
Pronoun	.323	.481**	-.089
Repetition	.405**	.377*	.158
Synonym	.157	.017	.288
Class inclusion	.362*	.306	-.066
Inclusion	.198	.262	.083
Formal repetition	.128	.141	.064
Total referential	.405**	.438**	.046
Condition	.177	.281	.031
Conjunction	.081	.337*	-.127
Disjunction	-.103	.131	-.106
Temporal conjunction	.295	.008	.082
Temporal disjunction	.239	.105	-.212
Contrast	.214	.141	.099
Comparison	.243	.106	-.072
Total logical	.199	.361*	-.160
Number topics	.346*	.407**	-.099
Amount subordination	.355*	.265	.027
First order	.057	-.312	-.205
Second order	.066	.170	-.257

** .01 level of significance
* .05 level of significance

denotational, verb denotational, other denotational (prepositions, connectives, expletives), grand total denotational, syntactic information, pronoun, repetition, total referential, conjunction, total logical, and number of topics (see Table IV-24).

For eleven year old students, this hypothesis was not rejected (see Table IV-24).

Discussion

Twenty-nine language variables were examined and significant positive correlations with reading achievement were found for eleven variables at age nine and fourteen at age ten. These findings suggest that a relationship exists between children's writing and their ability to comprehend written language. This relationship would appear to be stronger in the case of the following nine variables which showed significant correlations at both age nine and age ten: number of words, relational information, noun denotational, verb denotational, grand total denotational, syntactic information, repetition, total referential, and number of topics.

Evanechko, Ollila, and Armstrong (1974) found that the number of communication units written by a group of grade six children was related positively to their achievement on a test of reading comprehension. As a result, they concluded that fluency in written language seemed to be linked to reading success. Fluency in written language might also be a factor operating in the positive correlations observed in the present study.

At the eleven year old level, no significant correlations were noted. It would seem unlikely that the relationships evident

at the younger ages would totally cease at age eleven. Significant relationships might have occurred at each age level if all three groups had written the same reading test battery.

Hypothesis 5(b):

> There will be no significant relationships between I.Q. scores and denotational, relational, contextual, and syntactic information.

For nine year old students, this hypothesis was not rejected (see Table IV-25).

For ten and eleven year old students, this hypothesis was rejected for inclusion and first order topics (see Table IV-25).

Discussion

The correlations between the I.Q. scores and the twenty-nine language variables were generally positive. In only two instances were significant correlations revealed. A negative relationship was found for the number of first order topics written by the ten and eleven year old students. The children with the lower I.Q. scores tended to place more of their topics at the first order than did the children with the higher I.Q. scores. This finding would seem to fit the significant reduction in the use of first order topics which was found between ages nine and eleven (see Tables IV-11, IV-14). The other significant correlation involved a positive relationship between I.Q. scores at ages ten and eleven and the use of inclusion. Any interpretation of this relationship would be quite speculative due to the low rate of occurrence for inclusion in the children's writing (see Table IV-12).

TABLE IV-25

CORRELATION COEFFICIENTS BETWEEN LANGUAGE VARIABLES AND IQ SCORES

Variable	9 yr. olds	10-11 yr. olds
Number T-units	.124	.077
Number words	.258	.135
Number mazes	.047	-.179
Relational information	.221	.093
Noun—Denotational	.277	.179
Verb—Denotational	.233	.158
Other—Denotational	.261	.094
Total denotational	.253	.149
Syntactic	.286	.127
Passive	.065	.114
Pronoun	.144	.122
Repetition	.322	.144
Synonym	-.102	.138
Class inclusion	.113	-.027
Inclusion	.279	.237*
Formal repetition	-.022	.226
Total referential	.232	.152
Condition	.139	.089
Conjunction	.135	-.039
Disjunction	-.147	.150
Temporal conjunction	.054	.170
Temporal disjunction	.308	.078
Contrast	-.034	.061
Comparison	.018	-.021
Total logical	.208	.032
Number topics	.158	.112
Amount subordination	.173	.179
First order	.002	-.233*
Second order	.182	-.070

* .05 level of significance

The design of the present study may have contributed to the failure to find significant relationships between the I.Q. scores and language variables. In selecting the students, the use of a lower cut-off point of one standard deviation below the mean on the intelligence tests restricted the range of I.Q. scores. The range of I.Q. scores was further diminished by including only children from one age group at each grade level. Finally, the lack of scores derived from a common intelligence test may have limited and obscured correlations.

Hypothesis 5(c):

> There will be no significant relationships between socio-economic status and denotational, relational, contextual, and syntactic information.

This hypothesis was rejected for number of words, noun denotational, verb denotational, other denotational (prepositions, connectives, expletives), grand total denotational, repetition, and total referential (see Table IV-26).

Discussion

Twenty-four of the twenty-nine relationships between the language variables and socio-economic status were negative. On the five-point socio-economic rating scale used in this study, the highest socio-economic rating was indicated by one (1) and the lowest by five (5). For this reason, a negative correlation would indicate that the children with higher socio-economic ratings tended to produce more of the language variable in question. The seven significant correlations which were obtained were all negative.

TABLE IV-26

CORRELATION COEFFICIENTS BETWEEN LANGUAGE VARIABLES AND SES

Variable	9-10-11 year olds
Number T-units	-.176
Number words	-.229*
Number mazes	-.031
Relational information	-.163
Noun—Denotational	-.308**
Verb—Denotational	-.196*
Other—Denotational	-.217*
Total denotational	-.232**
Syntactic	-.184
Passive	.016
Pronoun	-.175
Repetition	-.265**
Synonym	-.145
Class inclusion	-.118
Inclusion	-.013
Formal repetition	-.129
Total referential	-.240**
Condition	.002
Conjunction	-.105
Disjunction	.093
Temporal conjunction	-.113
Temporal disjunction	-.063
Contrast	-.060
Comparison	.114
Total logical	-.104
Number topics	-.161
Amount subordination	-.129
First order	.108
Second order	-.099

** .01 level of significance
* .05 level of significance

Lawton (1968) studied a small sample of twelve and fifteen year old boys and found that middle class boys wrote significantly longer essays than working class boys. A similar factor of fluency might be involved in the significant relationships noted between socio-economic status and language variables in the present study. The socio-economic ratings for the children were closely grouped about the mean which may have limited the degree of the relationships which were found (see Table IV-27).

TABLE IV-27

MEANS AND STANDARD DEVIATIONS FOR SOCIO-ECONOMIC RATINGS

Age	Means	Standard Deviation
9	3.06	.74
10	2.97	.50
11	3.11	.61

VI. SUMMARY OF FINDINGS

In the present study statistical analyses of the data led to the following findings:

1. Differences between boys' and girls' written language were found for about ten percent of the variables which were examined. Where differences occurred, the girls produced greater amounts of information per T-unit than the boys.

2. There was a relationship between higher reading achievement and the production of greater amounts of certain types of written

information at ages nine and ten.

3. Higher socio-economic status was related to larger amounts of written information for about twenty-five percent of the variables which were studied.

4. Almost no relationship was found between I.Q. scores and the written language variables which were examined.

5. While differences in the written language variables occurred between age nine and ten and between age ten and eleven, the largest number of differences were evident between age nine and eleven.

6. Five types of denotational information increased significantly over ages nine to eleven (verb denotational, adverb, adjective, modal, and negative with the verb).

7. The number of subjects per T-unit increased over ages nine to eleven. This was probably due to greater use of subordinate clauses by the older students.

8. The number of subordinate topics per T-unit increased significantly between ages nine and eleven.

9. The number of topics per T-unit occurring at the first order decreased over ages nine to eleven. This seemed to be a result of the nine year old students usually introducing their key (most frequent) topic at the first or second order while the older students generally placed their key topic at the third and fourth order.

10. There was an increase over ages nine to eleven in the number of topics placed at the tenth, eleventh, and fourteenth order. The older children appear to elaborate more by writing on a greater

number of different topics (orders) in their narratives.

11. The amount of referential information per T-unit increased over ages nine to eleven.

12. The nature of the writing task and the content of the films may have affected the frequency with which children used the various types of logical and referential information.

13. The number of alternate syntactic structures per T-unit increased between age nine and eleven and between age ten and eleven. This may represent a movement, on the part of the older students, toward greater economy in the use of words to express information. A decrease over the same ages in the number of words and in the amount of denotational information per alternate syntactic structure lends further support for such a view.

14. The Semantic Potential Theory of Language appeared to offer a useful theoretical framework for describing and analyzing children's written language.

CHAPTER V

COMPARISON OF WRITTEN AND ORAL LANGUAGE RESULTS

This chapter presents a comparison of the children's written language with their oral language in relation to null hypothesis number six in Chapter I. The children's oral language results were obtained from the study carried out by Fagan (1978). Both the present study and Fagan's investigation were carried out within the same design (see Chapter III). This chapter is organized in the same manner as the preceding chapter.

I. HYPOTHESIS 6

Hypothesis 6(a):

> There will be no significant differences between children's written and oral language over ages nine, ten, and eleven for number of words per T-unit, incompletes, mazes per T-unit.

This hypothesis was rejected for number of words per T-unit, mazes per T-unit, and number of incompletes at ages nine and ten. The hypothesis was not rejected for number of incompletes at age eleven, as the probability of difference failed to reach the level of significance ($p = .05$). Table V-1 presents the data on which these decisions were made.

Discussion

At each of the three age levels, written T-unit length was greater than oral T-unit length. These differences are graphed in

TABLE V-1

SUMMARY OF T-TESTS FOR CORRELATED MEANS OVER AGE AND LANGUAGE TYPE FOR T-UNITS, WORDS PER T-UNIT, MAZES PER T-UNIT, AND NUMBER OF INCOMPLETES

		Means		Stan. Dev.			
Variable	Age	Written	Oral	Written	Oral	't' Value	p
Total number T-units	9	22.806	33.833	10.466	16.851	-4.297	.000
	10	24.833	34.250	12.646	16.523	-3.409	.002
	11	25.611	38.083	9.268	18.552	-4.689	.000
Words per T-unit	9	9.618	8.352	2.239	1.172	3.280	.002
	10	9.755	8.669	1.331	1.188	4.531	.000
	11	10.555	8.775	1.590	1.142	6.817	.000
Mazes per T-unit	9	.013	.567	.022	.269	-12.291	.000
	10	.006	.639	.021	.296	-12.778	.000
	11	.003	.395	.010	.242	-9.628	.000
Number of incompletes	9	.444	1.222	.724	1.204	-3.820	.001
	10	.556	1.694	.831	1.868	-3.686	.001
	11	.556	.833	.984	1.143	-1.536	.134

Figure 5-1. Although the differences did not reach statistical significance, O'Donnell et al. (1967) found that oral T-units were longer at grade three while written T-units were longer at grades five and seven. Loban (1976) did not find written T-unit length exceeded that of oral until the tenth grade. However, while the same stimuli were used to collect the oral and written discourse in the present study and O'Donnell et al.'s investigation, such was not the case in Loban's study. The fact that written T-units were longer in the present study was in large measure due to the greater use of subordination and alternate syntactic structures in the children's written language (see Tables V-4, V-7).

Mazes occurred much more frequently in the children's oral language than in their written language. The types of mazes found in the children's oral language were examined by Fagan (1978) who felt that they could be viewed as resulting from "attempts of the speaker to provide transition and organization in his thoughts" (p. 109). A different type of phenomenon seems to be involved in the case of written language mazes in that they generally involved unintentional errors on the part of the children. These errors would most likely have been corrected upon rereading what they had written.

Written incomplete T-units also seemed to be different in nature from oral incomplete T-units. In written language the incomplete T-units were almost entirely classifiable into one of three types:

i. An inadvertent omission of one or more words

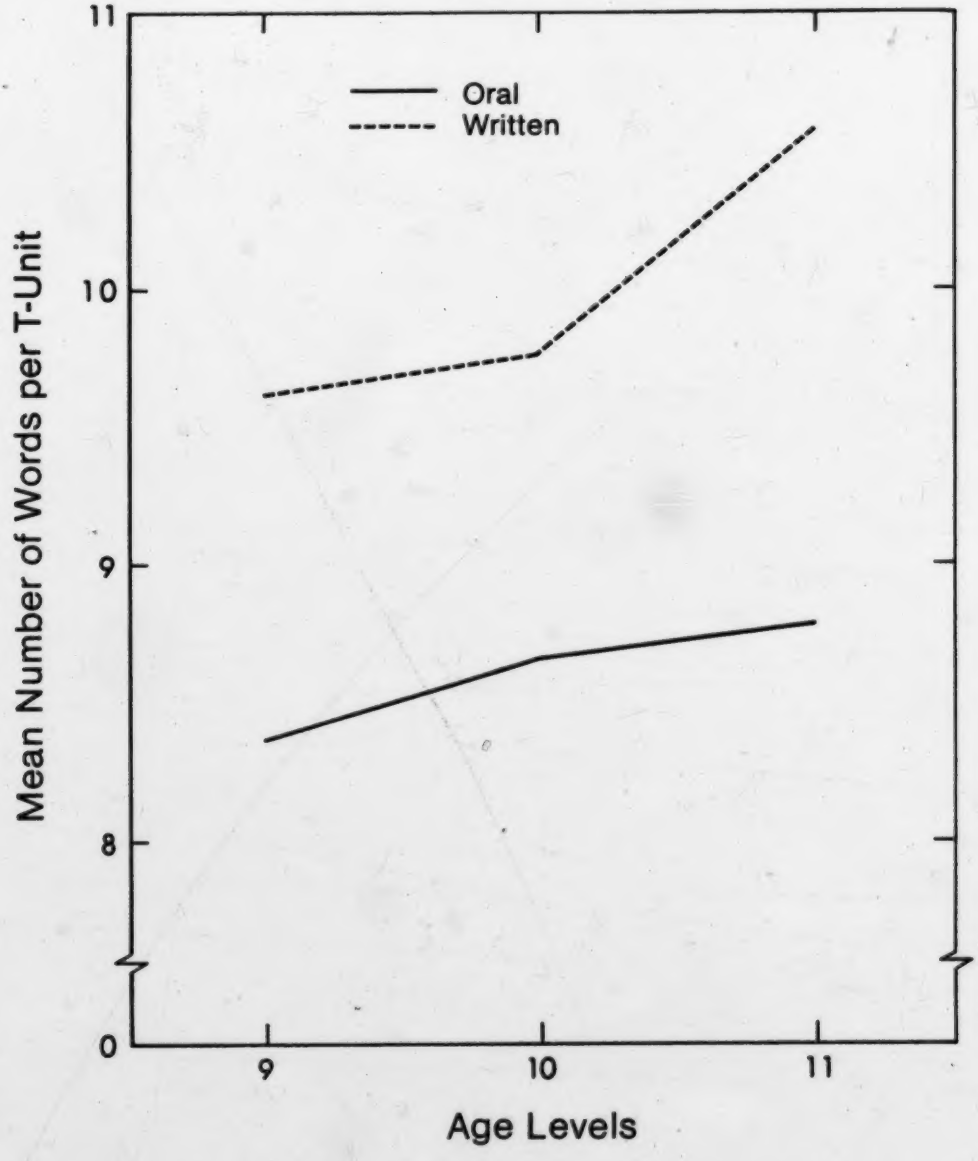

Figure 5-1 Number of Words per T-Unit for Children's Written and Oral Language

ii. The construction of a subordinate clause in isolation

iii. A direct quotation made without reference to the speaker.

Fagan (1978) found that in the children's oral language the incomplete T-unit was basically employed to clarify previously stated information.

Hypothesis 6(b)

> There will be no significant differences between children's written and oral language over ages nine, ten, and eleven for the amount of denotational information per T-unit.

For purposes of clarity, the t-test results for the large number of variables given in Table V-2 are classified below as to their acceptance or rejection with respect to the above hypothesis (classifications include ages nine, ten, and eleven, except where otherwise indicated):

Hypothesis Accepted	Hypothesis Rejected
negative (noun)	nouns
intensifier (noun)	adjectives
quantifier	adjective phrases
adjective clauses (10)	adjective clauses (9,11)
negative (verb)	determiners
intensifier (verb)	total noun denotational
verbals (9,10)	verbs
adverbs (10)	verbals (11)
adverb clauses of time (9)	adverbs (9,11)
adverb clauses of condition	adverb phrases
modals (9,10)	adverb clauses of time (10,11)
connectives (9,11)	modals (11)
expletives	total verb denotational
	prepositions
	connectives (10)
	grand total denotational

Discussion

The children in each age group used significantly larger amounts of denotational information in their written T-units than in their oral T-units. Figure 5-2 graphs the differences which occurred

TABLE V-2

SUMMARY OF T-TESTS FOR CORRELATED MEANS OVER AGE AND LANGUAGE TYPE FOR DENOTATIONAL INFORMATION PER T-UNIT

Variable	Age	Means		Stan. Dev.		't' Value	p
		Written	Oral	Written	Oral		
Nouns	9	2.965	2.460	.602	.328	4.881	.000
	10	3.077	2.678	.380	.352	5.660	.000
	11	3.227	2.537	.607	.375	7.316	.000
Adjectives	9	.214	.097	.124	.060	5.443	.000
	10	.239	.162	.123	.104	3.776	.001
	11	.300	.240	.148	.110	2.894	.006
Adjective phrase	9	.140	.088	.097	.066	3.438	.002
	10	.152	.093	.107	.073	3.545	.001
	11	.194	.110	.161	.066	3.241	.003
Adjective clause	9	.050	.017	.047	.021	4.003	.000
	10	.062	.055	.052	.043	.630	.533
	11	.062	.027	.038	.029	4.924	.000
Negative	9	.004	.005	.011	.012	-0.767	.448
	10	.008	.007	.021	.014	.138	.891
	11	.009	.020	.020	.031	-1.970	.057
Intensifier	9	.017	.008	.028	.016	1.568	.126
	10	.024	.027	.039	.041	-0.387	.701
	11	.019	.026	.030	.030	-1.143	.261
Quantifier	9	.190	.193	.125	.127	-0.171	.866
	10	.204	.168	.114	.113	1.895	.066
	11	.209	.184	.144	.090	1.244	.222
Determiner	9	1.399	.997	.390	.188	6.295	.000
	10	1.379	1.008	.306	.200	7.944	.000
	11	1.481	.959	.346	.231	9.493	.000
Total denotational for noun	9	2.014	1.405	.549	.286	7.569	.000
	10	2.067	1.521	.425	.322	8.413	.000
	11	2.273	1.567	.548	.311	8.946	.000
Verbs	9	1.547	1.301	.355	.161	3.704	.001
	10	1.516	1.361	.199	.161	4.476	.000
	11	1.620	1.322	.219	.171	6.614	.000

TABLE V-2 (Continued)

Variable	Age	Means		Stan. Dev.		't' Value	p
		Written	Oral	Written	Oral		
Verbals	9	.165	.162	.123	.135	.133	.895
	10	.185	.151	.132	.076	1.579	.123
	11	.214	.159	.121	.090	2.529	.016
Adverbs	9	.312	.393	.146	.150	-2.681	.011
	10	.321	.340	.162	.142	-0.526	.602
	11	.395	.256	.129	.128	5.262	.000
Adverb	9	.667	.425	.244	.142	6.652	.000
phrase	10	.708	.511	.194	.162	6.825	.000
	11	.759	.348	.264	.243	9.591	.000
Adverb	9	.070	.046	.103	.043	1.311	.198
clause	10	.080	.043	.073	.061	3.071	.004
(time)	11	.098	.041	.079	.046	5.025	.000
Adverb	9	.037	.032	.067	.042	.435	.666
clause	10	.050	.051	.056	.047	-0.054	.957
(condition)	11	.064	.060	.060	.041	.421	.676
Negative	9	.055	.056	.052	.042	-0.070	.945
	10	.071	.070	.054	.063	.049	.962
	11	.088	.074	.046	.040	1.651	.108
Intensifier	9	.007	.006	.015	.014	.275	.785
	10	.006	.015	.016	.028	-1.791	.082
	11	.011	.027	.023	.046	-1.973	.056
Modal	9	.082	.085	.060	.075	-0.240	.812
	10	.129	.113	.108	.084	1.215	.232
	11	.156	.079	.071	.072	7.113	.000
Total	9	1.397	1.208	.461	.331	2.386	.023
denotational	10	1.554	1.311	.413	.383	3.700	.001
for verb	11	1.787	1.047	.417	.401	10.341	.000
Preposition	9	.766	.562	.252	.180	5.389	.000
	10	.774	.594	.182	.172	5.798	.000
	11	.846	.596	.323	.197	5.949	.000
Connectives	9	1.099	1.119	.467	.218	-0.220	.827
	10	.939	1.131	.270	.186	-3.899	.000
	11	1.029	1.117	.277	.147	-1.672	.103

TABLE V-2 (Continued)

Variable	Age	Means		Stan. Dev.		't' Value	p
		Written	Oral	Written	Oral		
Expletive	9	.024	.019	.030	.025	.646	.523
	10	.020	.034	.039	.040	-1.635	.111
	11	.020	.033	.028	.052	-1.124	.269
Grand total denotational	9	9.812	8.074	2.334	1.152	4.429	.000
	10	9.947	8.602	1.376	1.306	5.732	.000
	11	10.803	8.707	1.773	3.299	3.617	.001

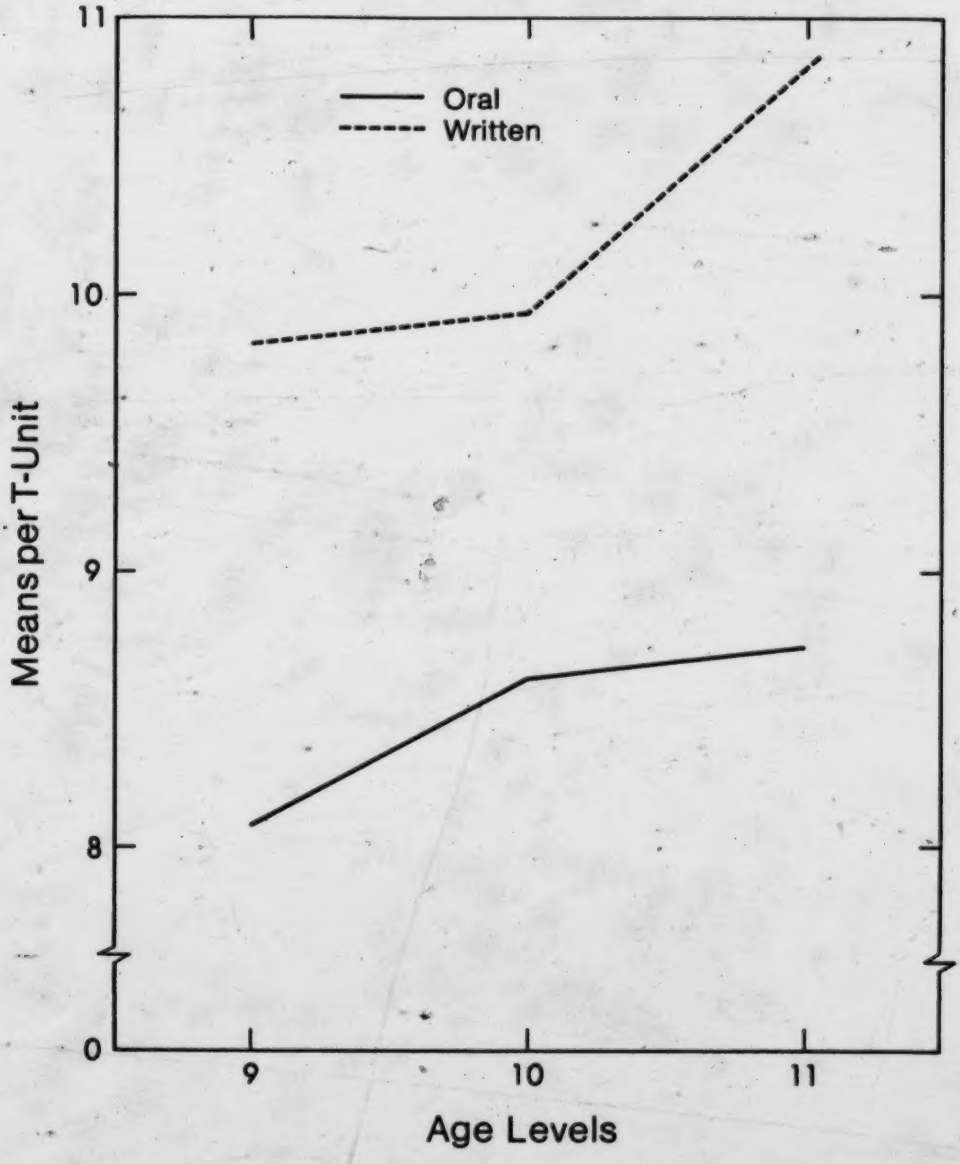

Figure 5-2 Mean Amounts per T-Unit of Denotational Information for Children's Written and Oral Language

and in conjunction with Figure 5-1 illustrates the close relationship which exists between total denotational information per T-unit and words per T-unit. Since the children produced longer written than oral T-units, one would expect to find greater amounts of total denotational information per written T-unit than per oral T-unit. The subtotals for denotational information associated with the noun and with the verb were both significantly greater in written language for all three grade levels. Similar results were obtained for seven of the remaining twenty types of denotational information subsumed under the grand total for denotational information. The seven categories were nouns, adjectives, adjective phrases, determiners, verbs, adverb phrases, and prepositions.

A total of sixty-nine oral-written comparisons was made over the three age groups. Thirty-nine of these comparisons showed significant differences between the children's written and oral language. The rate of occurrence per T-unit was greater for written than for oral language in all but two of the thirty-nine cases. The use of adverbs at age nine and connectives at age ten were significantly greater for oral language.

O'Donnell et al. (1967) found that and was employed as an initial coordinating conjunction in T-units approximately four times more frequently in oral than written language at grades three, five, and seven. A similar mechanism might be involved in the present finding that connectives were more common at each of the three age levels in oral language. While oral usage of connectives remained fairly equal at the three age levels, there were fewer connectives

used in writing at ages ten and eleven than at age nine. Discussion under Hypotheses 2(a) and 2(c)iii in the preceding chapter suggested that this decline in the use of connectives might also in part be due to a decreased use of and as a coordinator between main clauses.

The number of adverbs per T-unit decreased across ages nine, ten, and eleven in oral language and increased in written language. As a result, while the children used significantly more adverbs in oral language at age nine, by age eleven they were using significantly more adverbs in written language.

Overall, with increases in age, greater differentiation between oral and written language was noted for the majority of types of denotational information. This observation was based on an examination of where the largest 't' values occurred for each of the twenty-three types of denotational information. There were only three such occurrences for the nine year old students, while at ages ten and eleven there were five and fifteen, respectively.

In the discussion under Hypothesis 6(a), it was suggested that increased use of subordination and alternate syntactic structures helped account for the fact that written T-units were longer than oral T-units. These same two factors are undoubtedly involved to a considerable degree in the greater use of many of the denotational types of information in written language.

Hypothesis 6(c)

> There will be no significant differences between children's written and oral language over ages nine, ten, and eleven for the amount of relational information per T-unit.

This hypothesis was rejected for subjects, main verbs, total

relational information, complements at age nine, and direct objects at ages nine and eleven. The hypothesis was not rejected for indirect objects, direct objects at age ten, and complements at ages ten and eleven, since the probabilities of difference did not reach the level of significance ($p = .05$). These decisions were based on the data which are provided in Table V-3.

Discussion

The children in each age group used significantly more relational information in their written T-units than in their oral T-units. Figure 5-3 graphs these differences at the three age levels. With the exception of complements at age eleven, the oral-written differences for the other types of relational information all followed a similar pattern to that found for total relational information. In each case, the frequency of occurrence was greater for written than for oral language with the smallest difference occurring at age ten and the largest difference occurring at age eleven.

It might be expected that the amount of relational information per T-unit would be somewhat linked to the length of the T-units and the amount of subordination used. In fact, the same oral-written pattern outlined above was found for both words per T-unit and subordinates per T-unit (see Figures 5-1, 5-6).

The subject-verb and subject-verb-object patterns were by far the most common in both the children's oral and written language. O'Donnell et al. (1967) reported a similar finding when they examined the structural patterns of the main clauses written and spoken by the children in their study. They found that these two

TABLE V-3

SUMMARY OF T-TESTS FOR CORRELATED MEANS OVER AGE AND LANGUAGE TYPE FOR RELATIONAL INFORMATION PER T-UNIT

		Means		Stan. Dev.			
Variable	Age	Written	Oral	Written	Oral	't' Value	p
Subject	9	1.277	1.164	.223	.098	2.805	.008
	10	1.335	1.285	.136	.127	2.151	.038
	11	1.398	1.215	.156	.114	5.839	.000
Direct object	9	.594	.468	.195	.146	3.226	.003
	10	.554	.497	.198	.120	1.614	.116
	11	.607	.475	.151	.108	5.273	.000
Indirect object	9	.037	.032	.041	.029	.602	.551
	10	.034	.030	.041	.036	.713	.480
	11	.041	.026	.047	.044	1.469	.151
Complement	9	.068	.039	.058	.046	2.737	.010
	10	.090	.080	.141	.071	.579	.566
	11	.071	.077	.063	.078	-0.464	.646
Main verb	9	1.539	1.301	.350	.161	3.639	.001
	10	1.506	1.361	.201	.161	4.166	.000
	11	1.602	1.321	.189	.170	7.298	.000
Total relational	9	3.514	3.021	.693	.322	3.725	.001
	10	3.499	3.251	.390	.350	3.365	.002
	11	3.719	3.127	.420	.370	7.119	.000

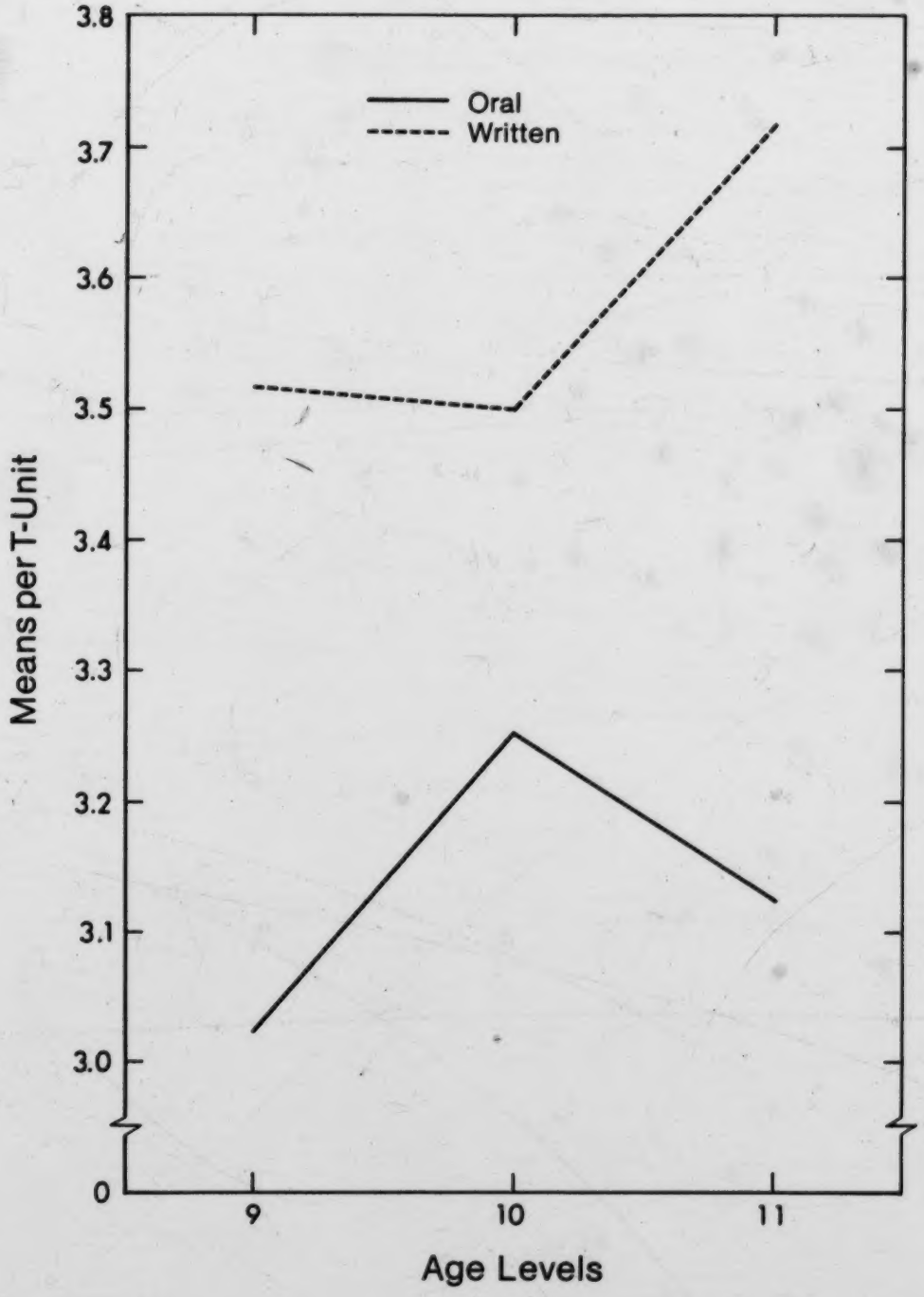

Figure 5-3 Mean Amounts per T-Unit of Relational Information for Children's Written and Oral Language

patterns accounted for about eighty-five percent of the patterns used in grades three, five, and seven in both speech and writing.

Hypothesis 6(d)

> There will be no significant differences between children's written and oral language over ages nine, ten, and eleven for the amount of contextual information per T-unit, consisting of:
>
> (i) topics and ordering
> (ii) referential information
> (iii) logical information.

6(d)i. The t-test results are contained in Table V-4 and are classified as to their acceptance or rejection with respect to this hypothesis as follows (ages nine, ten, and eleven are included in the classifications unless otherwise indicated):

Hypothesis Accepted	Hypothesis Rejected
second order	number of topics
fifth order	number of different topics
sixth order	first order
number of subordinates (10)	number of subordinates (9,11)
third order (9)	third order (10,11)
fourth order (9)	fourth order (10,11)
eighth order (10)	eighth order (9,11)
tenth order (9,10)	tenth order (11)
seventh order	
ninth order	

6(d)ii. Table V-5 gives the t-test results which are classified as to their acceptance or rejection with respect to this hypothesis as follows:

Hypothesis Accepted	Hypothesis Rejected
repetition (11)	repetition (9,10)
synonym (9)	synonym (10,11)
class inclusion (9,10)	class inclusion (11)
inclusion (10,11)	inclusion (9)
formal repetition (10,11)	formal repetition (9)
total referential (9)	total referential (10,11)
pronoun	

TABLE V-4

SUMMARY OF T-TESTS FOR CORRELATED MEANS OVER AGE AND LANGUAGE TYPE FOR TOPICS AND ORDERING INFORMATION PER T-UNIT

		Means		Stan. Dev.			
Variable	Age	Written	Oral	Written	Oral	't' Value	p
Number of topics	9	1.276	1.190	.228	.105	2.073	.046
	10	1.349	1.207	.150	.119	5.413	.000
	11	1.408	1.193	.148	.098	8.306	.000
Number of different topics	9	.431	.295	.108	.108	6.683	.000
	10	.493	.340	.187	.138	6.050	.000
	11	.481	.280	.129	.097	10.494	.000
Number of subordinates	9	.262	.184	.193	.091	2.235	.032
	10	.318	.270	.139	.141	1.765	.086
	11	.376	.227	.125	.094	7.212	.000
First order	9	.257	.411	.259	.277	-2.172	.037
	10	.154	.352	.245	.316	-3.262	.002
	11	.105	.216	.175	.256	-2.295	.028
Second order	9	.289	.215	.296	.236	1.044	.304
	10	.214	.284	.258	.242	-1.143	.261
	11	.267	.396	.327	.295	-1.812	.078
Third order	9	.212	.133	.265	.169	1.554	.129
	10	.374	.107	.297	.132	4.568	.000
	11	.292	.148	.263	.144	2.732	.010
Fourth order	9	.117	.104	.118	.078	.525	.603
	10	.135	.077	.129	.063	2.524	.016
	11	.171	.091	.209	.088	2.114	.042
Fifth order	9	.101	.087	.089	.063	.783	.439
	10	.072	.069	.052	.053	.310	.758
	11	.106	.082	.084	.061	1.275	.211
Sixth order	9	.077	.085	.049	.089	-0.427	.672
	10	.074	.063	.064	.065	.780	.440
	11	.081	.079	.065	.071	.085	.933
Seventh order	9	.051	.054	.051	.053	-0.217	.830
	10	.066	.060	.057	.056	.503	.618
	11	.071	.053	.048	.053	1.483	.147

TABLE V-4 (Continued)

Variable	Age	Means		Stan. Dev.		't' Value	p
		Written	Oral	Written	Oral		
Eighth order	9	.073	.039	.078	.067	2.035	.050
	10	.075	.050	.079	.074	1.428	.162
	11	.086	.047	.081	.055	2.357	.024
Ninth order	9	.046	.019	.077	.024	2.004	.053
	10	.043	.040	.045	.070	.195	.847
	11	.052	.046	.051	.066	.495	.624
Tenth order	9	.019	.018	.027	.038	.102	.920
	10	.037	.025	.048	.029	1.364	.181
	11	.047	.020	.051	.028	2.644	.012

TABLE V-5

SUMMARY OF T-TESTS FOR CORRELATED MEANS OVER AGE AND LANGUAGE TYPE FOR REFERENTIAL INFORMATION PER T-UNIT

		Means		Stan. Dev.			
Variable	Age	Written	Oral	Written	Oral	't' Value	p
Pronoun	9	1.140	1.196	.279	.197	-1.172	.249
	10	1.184	1.260	.375	.265	-1.245	.221
	11	1.212	1.267	.253	.231	-1.143	.261
Repetition	9	.619	.446	.326	.168	3.624	.001
	10	.705	.442	.326	.180	5.103	.000
	11	.716	.545	.245	.504	1.788	.082
Synonym	9	.125	.105	.077	.070	1.527	.136
	10	.165	.106	.108	.072	3.585	.001
	11	.169	.096	.099	.054	5.646	.000
Class inclusion	9	.067	.050	.057	.040	1.432	.161
	10	.085	.072	.069	.032	1.149	.258
	11	.094	.050	.054	.035	5.005	.000
Inclusion	9	.014	.042	.029	.057	-2.863	.007
	10	.031	.034	.051	.032	-0.279	.782
	11	.026	.028	.033	.032	-0.210	.835
Formal repetition	9	.041	.003	.054	.009	4.184	.000
	10	.058	.066	.057	.049	-0.650	.520
	11	.045	.056	.034	.025	-1.807	.079
Total referential	9	2.007	1.867	.494	.326	1.806	.080
	10	2.193	1.978	.435	.347	3.092	.004
	11	2.265	1.986	.367	.327	4.130	.000

6(d)iii. The results of the t-tests are provided in Table V-6 and they are classified as to their acceptance or rejection with respect to this hypothesis as follows:

Hypothesis Accepted	Hypothesis Rejected
condition	conjunction
disjunction	total logical
temporal conjunction (10,11)	temporal conjunction (9)
temporal disjunction (9,11)	temporal disjunction (10)
contrast (11)	contrast (9,10)
comparison (10,11)	comparison (9)

Discussion

The nine, ten, and eleven year old groups each used significantly more topics per T-unit in their written language than in their oral language. Figure 5-4 illustrates how this gap widened with increases in age. This difference may largely be attributed to the fact that each age group placed more topics in subordinate clauses in written than in oral language. These oral-written differences for the number of subordinates (topics which occur in subordinate clauses) per T-unit are graphed in Figure 5-5 and were significant at ages nine and eleven.

Harrell (1957), using LaBrant's subordination index, reported that his nine year old children used an equal amount of subordination in both oral and written language. However, the eleven year old children in his study used significantly more subordination in written language. While statistical tests of significance were not applied, Loban (1976) found that his Low Language Proficiency Group at grades four, five, and six employed considerably more dependent clauses per T-unit in oral than in written language. The High Language Proficiency

TABLE V-6

SUMMARY OF T-TESTS FOR CORRELATED MEANS OVER AGE AND LANGUAGE TYPE FOR LOGICAL INFORMATION PER T-UNIT

Variable	Age	Means		Stan. Dev.		't' Value	p
		Written	Oral	Written	Oral		
Condition	9	.051	.072	.077	.069	-1.414	.166
	10	.066	.057	.061	.049	.838	.408
	11	.080	.068	.059	.051	1.003	.323
Conjunction	9	.660	.645	.375	.172	.213	.832
	10	.481	.633	.283	.211	-3.066	.004
	11	.567	.724	.229	.167	-3.417	.002
Disjunction	9	.010	.021	.026	.034	-1.942	.060
	10	.007	.013	.016	.019	-1.916	.064
	11	.011	.014	.028	.024	-0.364	.718
Temporal conjunction	9	.022	.006	.042	.017	2.092	.044
	10	.064	.051	.063	.062	1.296	.204
	11	.048	.027	.066	.041	1.852	.072
Temporal disjunction	9	.259	.371	.169	.140	-3.285	.002
	10	.210	.298	.195	.166	-2.720	.010
	11	.225	.238	.125	.120	-0.492	.626
Contrast	9	.036	.017	.050	.028	2.334	.026
	10	.067	.024	.076	.031	3.527	.001
	11	.044	.030	.044	.031	1.916	.064
Comparison	9	.002	.014	.011	.026	-2.448	.020
	10	.012	.003	.026	.009	1.942	.060
	11	.013	.013	.024	.019	-0.109	.914
Total logical	9	1.046	1.140	.438	.168	-1.229	.227
	10	.908	1.086	.273	.186	-3.458	.001
	11	.997	1.107	.276	.161	-2.115	.042

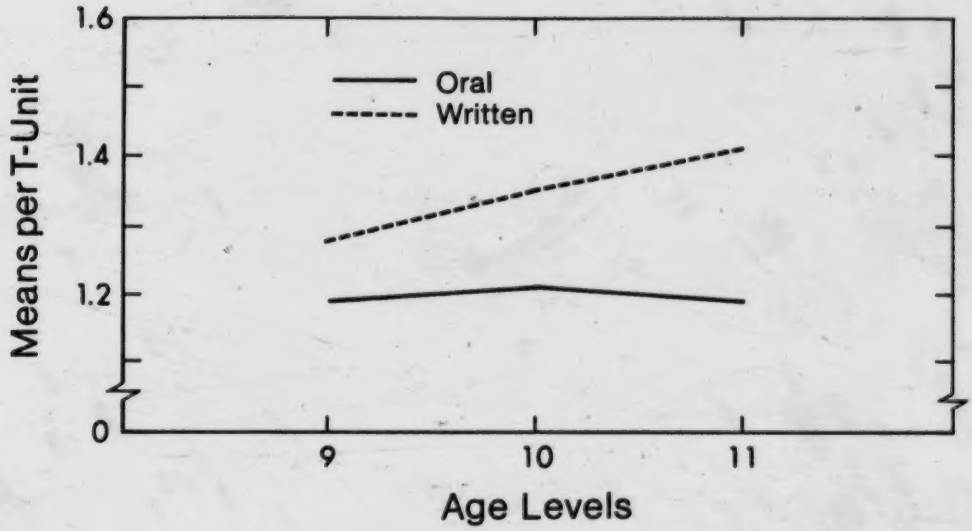

Figure 5-4 Mean Number of Topics per T-Unit for Children's Written and Oral Language

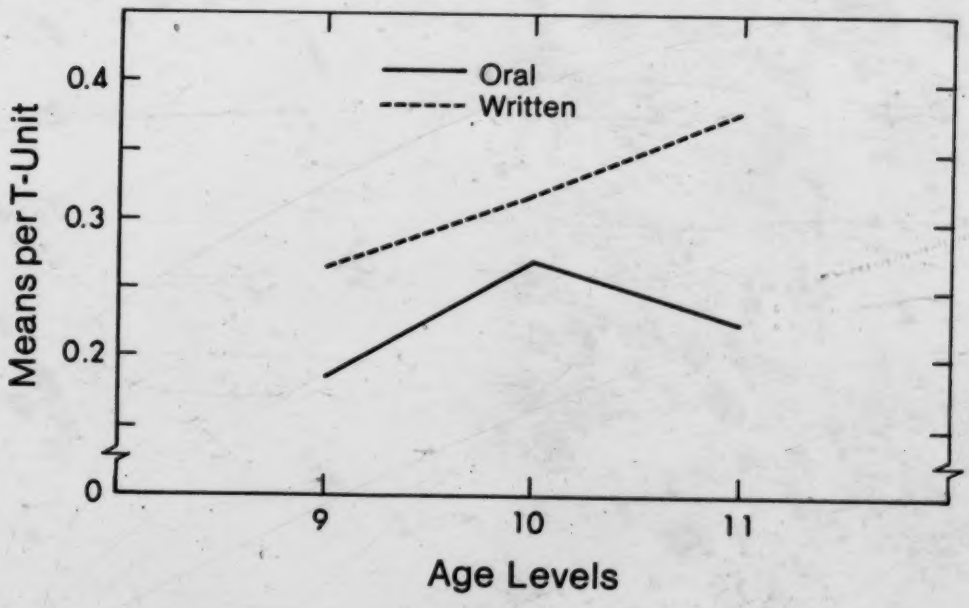

Figure 5-5 Mean Number of Subordinates per T-Unit for Children's Written and Oral Language

Group at these grade levels used virtually the same number of dependent clauses per T-unit in both oral and written language. In interpreting these findings, it should be noted that neither Harrell or Loban used identical stimuli to elicit the oral and written discourse as was done in the present study.

At ages nine, ten, and eleven there was a significantly greater number of different topics (orders) per T-unit employed in written language. The oral and written results for this variable are graphically presented in Figure 5-6. An examination of the means in Table V-4 shows that the increased use of subordinates can only partially explain the greater number of different topics per T-unit found in written language. It would appear that in contrast to their written language, the children tended to elaborate more on each different topic (order) within their oral narratives.

Several points were noted in examining the data on the occurrence per T-unit of topics at each of the various orders. The children at each age level placed significantly more topics at the first order in oral language. The graph presented in Figure 5-7 shows these oral-written differences. At ages nine and ten, the children placed more topics at the first order in their oral language than at any succeeding order. These results suggest that the children more often put their key (most frequent) topic at the first order in oral than in written language. In both forms of language the number of topics placed at the first order decreased at age ten and again at age eleven. The discussion in Chapter IV for this finding in written language is probably also relevant for oral language. It would

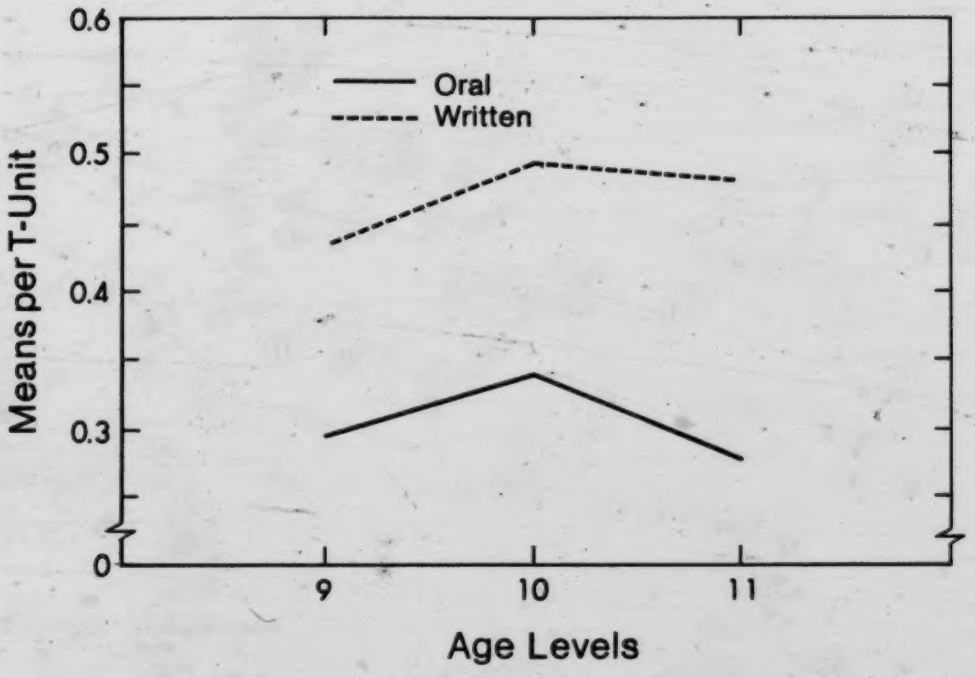

Figure 5-6 Mean Number of Different Topics (Orders) per T-Unit for Children's Written and Oral Language

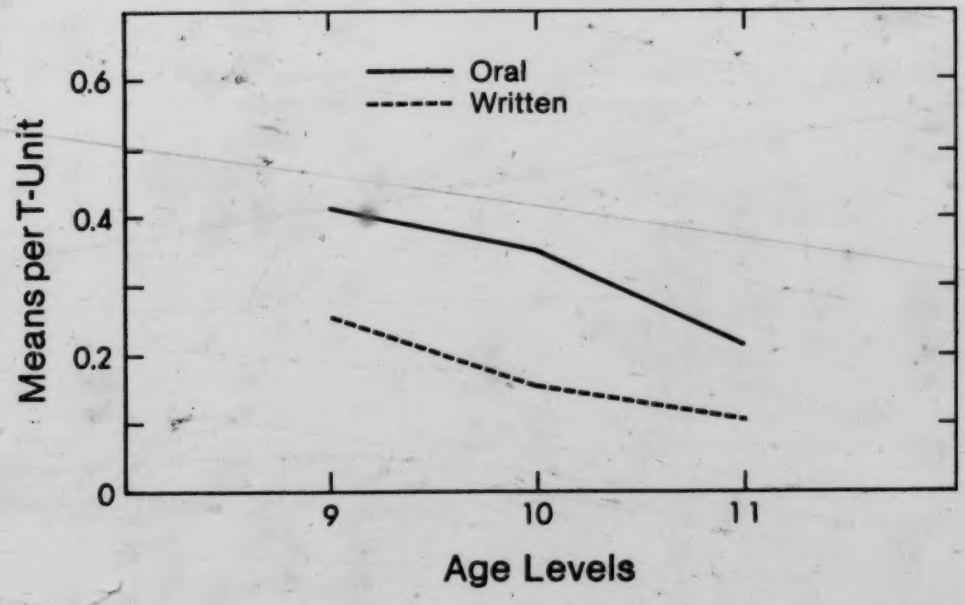

Figure 5-7 Mean Number of First Order Topics per T-Unit for Children's Written and Oral Language

appear, then, that with increasing age there may be a greater awareness of the need to provide some initial background for the listener/reader before introducing the key topic in the narrative.

The ten and eleven year old children placed significantly more topics at the third and fourth orders in written language. These two age groups seem to have placed their key topics more frequently at the first and second orders in oral language while often waiting until the third or fourth order to introduce the key topics in their writing. Significantly greater numbers of topics were used in written language by the nine and eleven year old children at the eighth order and by the eleven year old children at the tenth order. These findings likely resulted from the use of a greater number of different topics in the written language.

Each age group of children employed more referential information per T-unit in written than in oral language. These differences are graphed in Figure 5-8 and were significant at ages ten and eleven. The greater amounts of total denotational information and topics per T-unit (see Tables V-2, V-4) in the children's written language would lead one to expect that increased numbers of relationships would be expressed through the use of more referential information per T-unit.

The relative frequency of occurrence per T-unit of the six types of referential information was basically the same in both oral and written language. Pronouns were used more often than all the other five types combined. Repetitions and synonyms comprised the second and third most common categories.

Greater use of repetition was the main factor which led to

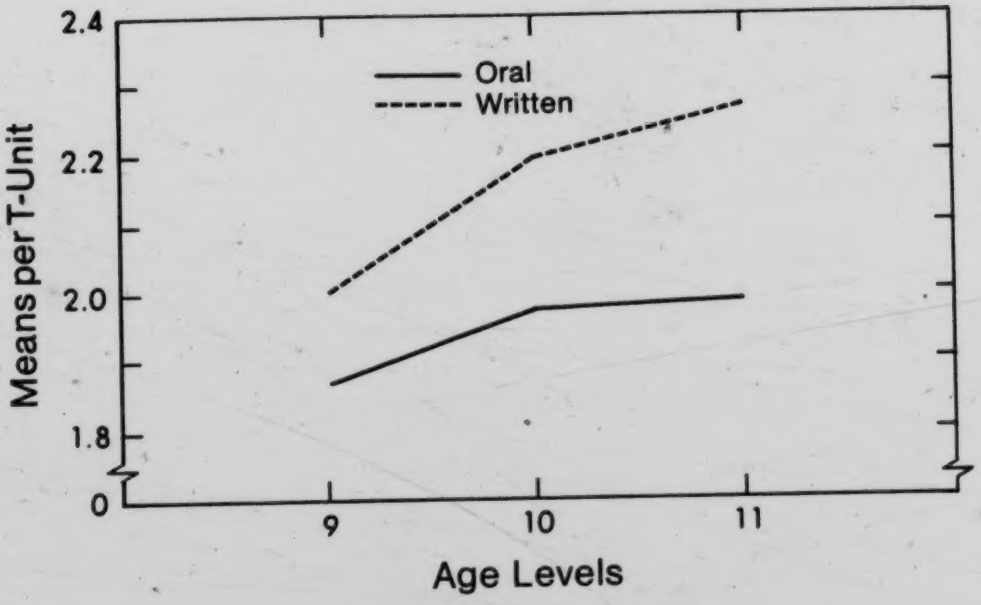

Figure 5-8 Mean Amounts per T-Unit of Referential Information for Children's Written and Oral Language

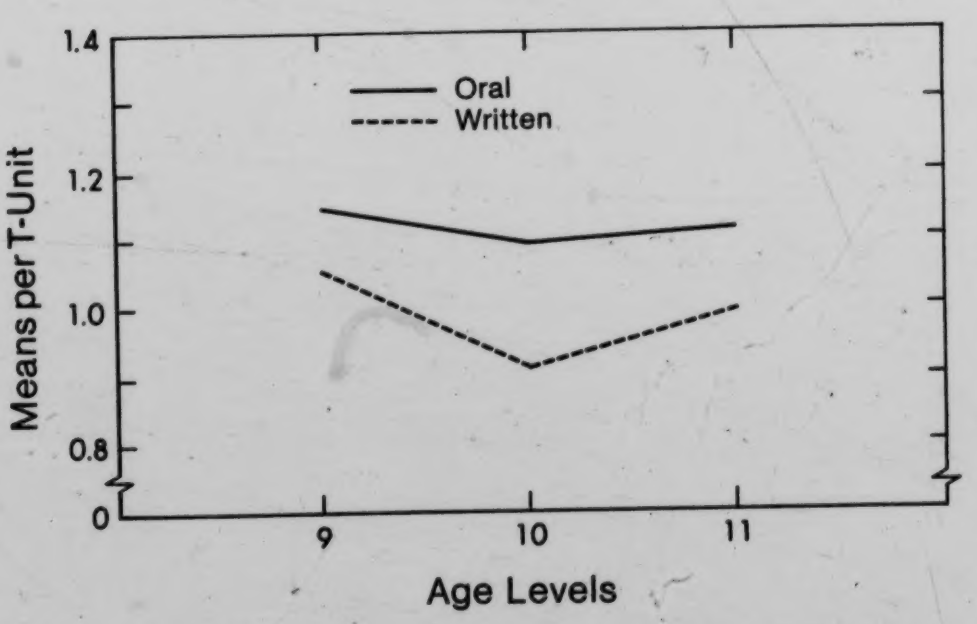

Figure 5-9 Mean Amounts per T-Unit of Logical Information for Children's Written and Oral Language

the use of more total referential information in the children's written language. Another contributing factor at ages ten and eleven was the significantly greater amount of synonyms which were employed in writing. Since more time is available for reflection when writing, this might help account for a larger number of synonyms. Significantly more formal repetitions at age nine and class inclusions at age eleven also occurred in the written language. In oral language, there were more pronouns, inclusions, and, for ages ten and eleven, more formal repetitions. However, only in the case of inclusions at age nine was this difference significant.

The total amount of logical information per T-unit used at each age level was larger for oral than for written language. Figure 5-9 illustrates these differences which reached the level of significance at ages ten and eleven.

Conjunction was the most frequent type of logical information employed by the children followed by temporal disjunction. Together these two types made up seventy-five percent or more of the logical information used at each age level in both forms of language. The connective and was the one used mainly in the conjunction category. At ages nine, ten, and eleven, and was employed as a coordinator between written T-units two hundred and thirty-one, one hundred and sixty-one and two hundred and five times, respectively. This reduction in the use of and to link T-units at ages ten and eleven probably largely accounts for the fact that significantly fewer conjunctions and total logical information were used in the written language at these ages than in the oral language. Some support for this view was

noted earlier in that O'Donnell et al. (1967) had found that and was used as an initial coordinating conjunction in T-units much more often in oral than written language at grades three, five, and seven.

Temporal disjunction was another category of logical information which occurred more commonly in the children's oral language. The connectives then and and then were most frequently used to indicate temporal disjunction. The percentage of logical information in writing expressed in categories other than conjunction and temporal disjunction was about eight percent higher at ages ten and eleven than was the comparable percentage in oral language at these ages. When this comparison was made at age nine, the situation was reversed with oral language being eleven percent higher. These results may indicate a shift with age to greater variety in the types of logical information used in written language as compared to oral language.

Hypothesis 6(e)

> There will be no significant differences between children's written and oral language over ages nine, ten, and eleven for the amount of syntactic information per T-unit.

The t-test results are contained in Table V-7 and they are classified below as to their acceptance or rejection with respect to this hypothesis (ages nine, ten, and eleven are included in the classifications unless otherwise indicated):

Hypothesis Accepted	Hypothesis Rejected
Relative Clause (10)	Relative Clause (9,11)
That + S subject/object	Common Elements
WH + S subject/object	WH + Auxiliary/Verb
Infinitive Object	Total Syntactic
Infinitive Purpose (10,11)	Infinitive Purpose (9)
Adverb Expansion-1 (9,10)	Adverb Expansion-1 (11)
WH (9)	WH (10,11)

TABLE V-7

SUMMARY OF T-TESTS FOR CORRELATED MEANS OVER AGE AND LANGUAGE TYPE FOR SYNTACTIC INFORMATION PER T-UNIT

		Means		Stan. Dev.			
Variable	Age	Written	Oral	Written	Oral	't' Value	p
Relative clause	9	.050	.017	.047	.021	4.003	.000
	10	.062	.056	.052	.042	.562	.578
	11	.062	.027	.038	.029	4.924	.000
That + S subj./obj.	9	.022	.023	.029	.030	-0.316	.754
	10	.026	.034	.043	.040	-1.295	.204
	11	.027	.035	.035	.041	-0.949	.349
WH + S subj./obj.	9	.010	.012	.018	.020	-0.516	.609
	10	.008	.003	.018	.008	1.546	.131
	11	.017	.018	.035	.025	-0.148	.883
Infinitive object	9	.056	.065	.072	.072	-0.783	.439
	10	.074	.074	.080	.060	.007	.995
	11	.070	.066	.061	.052	.326	.746
Infinitive purpose	9	.035	.016	.041	.040	2.513	.017
	10	.043	.030	.062	.037	1.006	.321
	11	.031	.034	.039	.040	-0.426	.672
Ing - nominative	9	.034	.046	.046	.046	-1.037	.307
	10	.034	.033	.038	.033	.080	.936
	11	.060	.053	.052	.052	.647	.522
Adv. expansion-1	9	.106	.082	.130	.065	.947	.350
	10	.135	.112	.088	.084	1.659	.106
	11	.164	.103	.111	.066	3.522	.001
Common elements	9	.311	.115	.259	.125	4.451	.000
	10	.227	.113	.163	.093	4.114	.000
	11	.294	.121	.152	.092	6.539	.000
WH	9	.021	.002	.056	.005	2.003	.053
	10	.020	.007	.029	.018	2.570	.015
	11	.019	.005	.037	.011	2.115	.042
WH auxiliary/ verb	9	.063	.026	.058	.029	3.408	.002
	10	.079	.038	.060	.043	4.655	.000
	11	.088	.045	.063	.042	3.670	.001

TABLE V-7 (Continued)

Variable	Age	Means		Stan. Dev.		't' Value	p
		Written	Oral	Written	Oral		
(That) + S obj.	9	.044	.029	.058	.031	1.304	.201
	10	.059	.030	.052	.041	2.941	.006
	11	.074	.025	.070	.039	4.086	.000
(That) + S obj. quote	9	.031	.028	.045	.050	.228	.821
	10	.027	.022	.052	.042	.656	.516
	11	.026	.024	.051	.041	.415	.681
With phrase	9	.004	.001	.013	.005	1.318	.196
	10	.007	.006	.016	.013	.375	.710
	11	.007	.004	.018	.008	.922	.363
Adjective	9	.097	.072	.128	.059	1.139	.046
	10	.045	.050	.045	.088	-0.307	.761
	11	.134	.051	.103	.116	3.342	.002
Participle	9	.011	.006	.025	.016	1.181	.245
	10	.014	.001	.026	.006	2.812	.008
	11	.016	.008	.039	.018	1.242	.222
Genitive	9	.041	.022	.064	.028	1.615	.115
	10	.050	.031	.090	.046	1.552	.130
	11	.050	.015	.048	.029	4.451	.000
Total syntactic	9	.931	.573	.453	.247	4.446	.000
	10	.937	.659	.303	.235	5.646	.000
	11	1.161	.663	.273	.194	9.441	.000
Passive	9	.020	.008	.032	.016	1.933	.061
	10	.032	.006	.048	.022	2.715	.010
	11	.035	.008	.043	.021	2.997	.005

Hypothesis Accepted	Hypothesis Rejected
(That) + S object (10,11)	(That) + S object (9)
Adjective (10)	Adjective (9,11)
Participle (9,11)	Participle (10)
Genitive (9,10)	Genitive (11)
Passive (9)	Passive (10,11)
Ing-Nominative	
(That) + S object quote	
With Phrase	

Discussion

The total number of alternate syntactic structures used at each age was significantly greater for written than for oral language. Figure 5-10 graphs these differences and illustrates how the gap widens considerably at age eleven. O'Donnell et al. had found that the fifth and seventh grade children in their 1967 study used significantly more sentence-combining transformations per T-unit in writing than in speech. At the third grade level, the students had used more sentence-combining transformations in speech than in writing but the difference was statistically nonsignificant. Most of the alternate syntactic structures examined in the present study were represented in the sentence-combining transformations studied by O'Donnell et al. The oral-written differences found in these two studies for these variables would seem to fit together fairly well.

Sixteen different types of alternate syntactic structures occurred frequently enough to permit statistical comparisons between oral and written language. Over the three age levels, thirty-nine of the oral-written comparisons for these structures revealed greater use per T-unit for writing with nineteen of these differences reaching the level of significance. Only nine comparisons showed larger

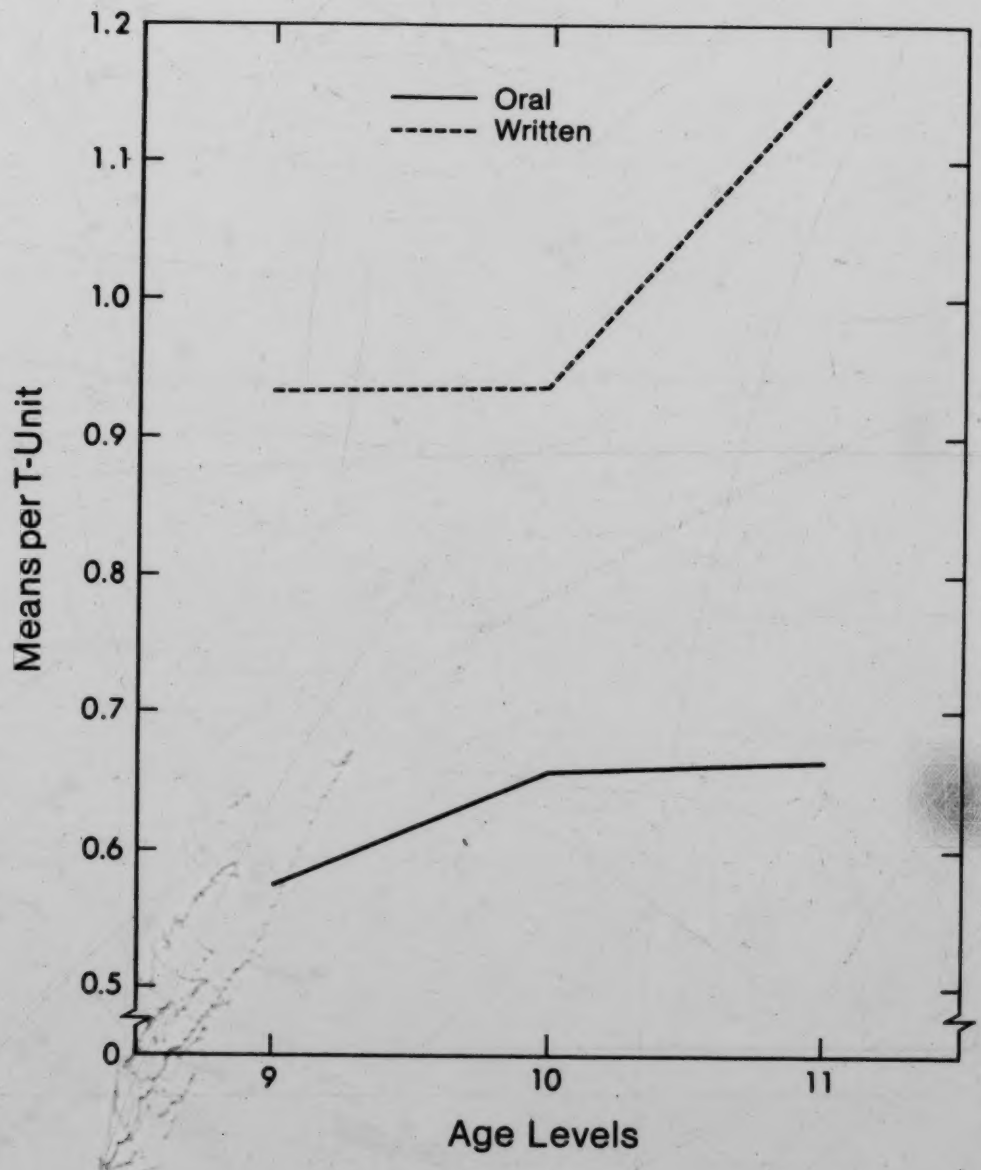

Figure 5-10 Mean Number of Alternate Syntactic Structures per T-Unit for Children's Written and Oral Language

amounts per T-unit for oral language and none of these differences were significant.

The most frequently employed alternate syntactic structure in both writing and speech was Common Elements, e.g., He went to a stream and got a pop. This structure and WH + Auxiliary/Verb (e.g., He went to a boat called Jean Francis) were the only ones that were used to a significantly greater degree in writing by all three age groups. Adverb Expansion-1 (e.g., While he was doing this two teenage boys came) which included almost all adverb clauses and the Relative Clause structure occurred more often in written language at ages nine, ten, and eleven. The oral-written differences were significant at ages nine and eleven for Relative Clause and at age eleven for Adverb Expansion-1. O'Donnell et al. (1967) had reported that both adverbial clauses and relative clauses were used more often in writing at grades five and seven but the differences were significant only for adverbial clauses. In their study, the passive construction was employed more in writing at grades five and seven but not to a significant degree. Passives were significantly more frequent in written language at ages ten and eleven in the present study. The preceding comparisons indicate that although the oral-written differences found in the two studies varied in magnitude, their direction was similar.

In the discussion under Hypothesis 3(b) in Chapter IV, the role that alternate syntactic structures might play in the economical expression of information was described. The greater total use of these structures in writing at each of the three age levels suggests

that the students were able to communicate with more economy in writing than in speech. O'Donnell et al. stated that it was "possible that fifth and seventh graders wrote compositions shorter than their oral discourses because they packed more information into written units" (1967, p. 44). Such a possibility might help account for the fact that the written language samples were shorter than those for oral language in the present study (see Table V-8).

TABLE V-8

MEAN WORD LENGTH OF ORAL AND WRITTEN LANGUAGE

Variable	Age 9	Age 10	Age 11
Oral	282.6	296.9	334.2
Written	219.3	242.2	270.3

II. SUMMARY OF FINDINGS

Statistical analyses of the data in the present study and in the investigation by Fagan (1978) led to the following findings:

1. At each of the three age levels, there were more words, denotational information, relational information, and alternate syntactic structures per written T-unit than per oral T-unit. These differences were all highly significant statistically.

2. More referential information per T-unit was used in writing than in speech and the difference became significant at ages ten and eleven. The children's written language was characterized by greater use of repetitions and synonyms.

3. There was more logical information per T-unit for oral than written language and this was significantly so at ages ten and eleven. These significant differences largely resulted from a reduction in the use of the conjunction category in written language.

4. The eleven year old children showed more differentiation between their oral and written language than the nine year olds in terms of the amounts per T-unit of words, denotational information, relational information, referential information, logical information, and alternate syntactic structures.

5. A larger number of topics were placed by each age group at the first order in oral language than in written language. The ten and eleven year old children placed more topics at the third and fourth orders in written than in oral language. These findings were likely the result of a more delayed introduction of the key (most frequent) topic in writing.

6. A greater number of different topics (orders) were used by all ages in written language. The children seemed to introduce more orders in their writing but place more topics on the average at each order in their speech.

7. All ages used more topics per T-unit in writing than in speech. This difference was largely a result of using more subordinate clauses in writing.

8. The Semantic Potential Theory of Language appeared to provide a useful theoretical framework for analyzing and comparing children's oral and written language.

CHAPTER VI

CONCLUSIONS AND IMPLICATIONS

I. THE STUDY IN REVIEW

The present study was concerned firstly with an examination of children's written language development over ages nine, ten, and eleven and secondly with a comparison of children's oral and written language development over these ages. In most previous investigations relevant to these two areas, the focus was on syntax. The theoretical bases for the instruments used in these studies were generally not stated and methodological difficulties were apparent in many of the studies (see Chapter II). The descriptive instrument employed in this study had an explicit theoretical base and permitted not only an analysis of syntax, but also an examination of a variety of types of linguistic information at the sentence and discourse level.

The present investigation was part of a larger research project consisting of three interrelated studies each utilizing the same language analysis measures. The theory underlying the descriptive instrument used in these studies was called the Semantic Potential Theory of Language. This theory is set forth in the project's first study which was conducted by Fagan (1978). In that study, Fagan described the oral language performance of a sample drawn from a population of nine, ten, and eleven year old children. The present study, the second in the project, examined the written language performance of the same sample of children and then compared these

results with the oral language results from the first study. The project's final study was carried out by Adams (1979) who described the language of authors in fourth, fifth, and sixth grade basal readers and then compared his findings with the oral and written language results in the first two studies.

For the present study, a sample of one hundred and eight children was selected consisting of thirty-six children at each age level equally divided between boys and girls After viewing one of two films, the children were asked to write all they could remember about the film in a letter to a friend. The instrument of language analysis was then applied to the written language so obtained. Oral language was collected within the same design and analyzed in the study by Fagan (1978). The results of the two forms of language were compared in the present investigation.

II. MAJOR CONCLUSIONS

The summary of findings for the children's written language given at the end of Chapter IV may be further summarized as follows:

1. Significant increases were observed over ages nine to eleven in the use of referential information, subjects within relational information, and five types of denotational information (verb denotational, adverb, adjective, modal, and negative with the verb).

2. The number of subordinate topics per T-unit, which closely reflected the use of subordinate clauses by the children, increased significantly between ages nine and eleven.

3. There was a decrease between ages nine and eleven in the

number of topics which occurred at the first order. This appeared to result from the older students' more frequent tendency to offer some frame of reference at the start of their narratives before stating the key (most frequent) topic.

4. The number of topics written at the tenth, eleventh, and fourteenth order increased over ages nine to eleven. This seemed to indicate an ability on the part of the older children to elaborate more in their narratives by the inclusion of a greater number of different topics (orders).

5. The eleven year old children used more alternate syntactic structures per T-unit than either the nine or ten year old children. This could represent a movement toward greater economy in the expression of information by the older students.

6. A limited number of differences existed between girls' and boys' written language with the girls producing greater amounts of information per T-unit for those variables where differences occurred.

7. Greater amounts of certain types of information were associated with higher reading achievement at ages nine and ten and with higher socio-economic status.

In Chapter V the summary of findings drawn from the comparison of the children's oral and written language was given. These findings are restated as follows:

1. The children at each age level employed more words, denotational information, relational information, and alternate syntactic structures in their written than in their oral T-units.

2. More referential information was used in writing than in speech by the ten and eleven year old children.

3. A reduction in the use of the conjunction category in writing resulted in less use of logical information in written language at ages ten and eleven.

4. Oral and written language were more distinct from each other at age eleven than at age nine with respect to the gap found between the amounts per T-unit of words, denotational information, referential information, logical information, and alternate syntactic structures.

5. The children used more topics per T-unit in their writing which seemed to be due mainly to a greater use of subordinate clauses in written language.

6. More different topics (orders) were introduced in written language and the children seemed more often to delay their placement of the key topic in writing than in speech.

Finally, the findings in Chapters IV and V of the present study provide support for the use of the Semantic Potential Theory of Language as a theoretical framework for analyzing children's written language development and comparing it with their oral language development.

III. IMPLICATIONS

The nature of the population sample and the mode of discourse (narrative) that were studied should be kept in mind when examining the following implications for the classroom teacher regarding

children's written language:

1. The use of certain types of denotational information increased considerably with age. Modals (especially can, will, have (to), and should) and adjectives were noteworthy in this respect. Their growth would likely be accelerated with instruction.

2. The younger children frequently launched their narratives by immediately stating their key topic. With increasing age, students seemed more aware of the need to provide some background information for their potential reader before introducing their key topic. Samples of children's writing, which illustrate these two approaches, could be examined with the students to help them become more conscious of the need to provide a frame of reference for their readers.

3. To the same end, the attention of students could be directed to the necessity of providing necessary referents for the pronouns they use.

4. There was a reduction in the use of the conjunction and as a coordinator between main clauses over age. At the same time certain categories of logical information employing such connectives as but, if, because, when, and while become more frequent. These developments could be assisted by the classroom teacher.

5. As was found in many previous studies and again in the present investigation, the older children made greater use of subordinate clauses. This finding relates somewhat to the preceding point and is a type of development which may also be influenced by instruction.

6. The eleven year old children, in contrast to the younger

children, were able to transmit more information with fewer words by employing greater numbers of alternate syntactic structures in place of the basic T-unit. The alternate syntactic structures which demonstrated the most growth in the present study and therefore might be particularly worth focusing on were the Ing-nominative, Adjective (coming before the noun), and Adverb Expansion-1 (see Appendix B for examples). A number of studies, such as the one by Miller and Ney (1968) who worked with fourth grade students, indicate that structures such as these can be increased in children's writing through the use of sentence-combining exercises.

7. At ages nine and ten, there appeared to be a positive relationship between children's written language and reading achievement. This relationship is likely to be an interactive process which suggests an integrative approach in teaching the two areas.

8. An increasing divergence between oral and written language was apparent over ages nine, ten, and eleven. This suggests the possibility of aiding children's written language development by providing instruction, as required, in those areas where the greatest differentiation seems to be occurring. The following are some language variables which might warrant such attention as they were used to an increasingly greater degree in writing than in speech: subordinate clauses, synonyms, passive constructions, adjectives (before the noun), adverb clauses of time, and modals.

9. Each child supplied an oral and written language sample after the film was viewed. Half of the children wrote first and the other half spoke first. The results of a two-tail t-test to measure

the effect of the speak/write order on written language output (total words and T-units) are provided in the following table:

TABLE VI-1

EFFECT OF ORDER OF RESPONSE ON WRITTEN LANGUAGE OUTPUT

	Means	Stan. Dev.	't' Value
Words			
Write/Speak	200.20	88.12	4.32**
Speak/Write	288.24	121.04	
T-units			
Write/Speak	20.48	8.18	3.97**
Speak/Write	28.35	12.07	

**Significant at the .001 level.

The children in the study who spoke first wrote significantly more words and T-units than the children who wrote first. This finding would seem to indicate that giving children the opportunity to say what they plan to write with even a passive listener could lead to greater written language output.

10. The film, The Huntsman, was seen by half of the children and The Stowaway was the film viewed by the other children. The story in The Stowaway was told primarily through narration, while in The Huntsman, it was told mainly through action. A two-tailed t-test was employed to see if the type of film had an effect on written language output (total words and T-units). The results are provided in the following table:

TABLE VI-2

EFFECT OF FILM TYPE ON WRITTEN LANGUAGE OUTPUT

	Means	Stan. Dev.	't' Value
Words			
Huntsman	273.74	118.48	2.77**
Stowaway	214.70	102.71	
T-units			
Huntsman	26.57	11.26	2.07*
Stowaway	22.26	10.39	

*Significant at the .05 level.
**Significant at the .01 level.

There was a significant difference in the number of words and T-units written for the two films. This points out the need to consider the nature of the stimulus and the motivational aspects of topics which are used to stimulate children's writing as well as the desirability of providing more than a single choice of topic.

IV. SUGGESTIONS FOR FURTHER RESEARCH

1. The descriptive instrument used to analyze the children's written language was quite time-consuming to apply. A more efficient instrument in terms of administrative usability (ease of scoring and interpretation) might be developed by further research employing those measures which revealed the most significant growth over the ages studied.

2. Growth in written language and increasing differentiation between oral and written language were found over the age/grade levels

that were studied. Younger and older age/grade levels need to be similarly examined in order to more fully understand these developments.

3. Research such as that carried out by Perron (1977) indicated that T-unit length could vary significantly within a single grade depending on what mode of written discourse (descriptive, narrative, expository, argumentative) was used. It would be useful to see if a similar variation would occur for many of the language variables if the present instrument of analysis were applied to children's writing in different modes of discourse.

4. A broader perspective of children's writing could be obtained by determining how the present findings might be influenced when factors such as the following were varied: the purpose for writing, the subject matter, the audience addressed, the method of presentation for input, and the students' level of interest.

5. Another question to explore would be the extent to which those language variables which showed promise as measures of written language growth are related to qualitative judgments of children's writing.

6. A possible relationship between reading achievement and children's written language was noted in the study. Further research as to the nature of this relationship is required.

7. Socio-economic status also appeared to be related to the children's written language. What this possible connection involves is open to further study.

8. The girls produced more of certain language variables than

the boys. More research is needed to determine why these differences occur and how important they may be.

V. SUMMARY

This study used a language analysis instrument based on the Semantic Potential Theory of Language to examine the written language development of children of ages nine, ten, and eleven and to compare their written with their oral language. Written language was found to develop along a number of parameters over the ages which were examined. The results also indicated that, over the same ages, written language became increasingly differentiated from oral language. On the basis of the study's findings, the Semantic Potential Theory of Language shows promise as a theoretical framework for further research into children's written and oral language.

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APPENDICES

APPENDIX A

DIVISION OF LANGUAGE SAMPLES INTO WORDS, T-UNITS, INCOMPLETE T-UNITS, AND MAZES

GENERAL GUIDELINES

Words

In cases where there is doubt as to the boundaries of a word, the division provided for that entry in Webster's New Collegiate Dictionary is to be followed.

In addition, the following rules are to be applied:

1. Solid or hyphenated compound words are counted as one word.

   e.g. Coke-a-Cola, homemade, fifty-two, seasick*

2. Contractions are counted as two words.

   e.g. I'll, didn't, wouldn't

3. Misspellings of contractions are counted as two words.

   e.g. there-they're; will-we'll

4. Signs, symbols, and abbreviations are considered equivalent to the words they represent.

   e.g. 50¢-fifty cents; $2.00-two dollars; &-and; Mr.-Mister

5. Words normally separated but written as one word by the child are counted as two words.

   e.g. kinda-kind of; golfballs-golf balls

6. Words normally written as one word but separated by the child are counted as one word.

   e.g. water proof-waterproof; a way-away

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*All of the examples provided in this appendix were taken from the children's written language.

Symbols for T-units and Mazes

/ T-unit boundary . (/ /) T-unit within the boundaries of a second T-unit

_____ Incomplete T-unit ( ) Maze

An example of symbols used to identify T-units and mazes is given in the transcription below.

/One day he was looking for golfballs in a pond/when two boys that tried (to) to take away his golfballs/the boy tried to not listen to them/but the boys had his cowboy boots/

T-unit - 3

Incomplete T-unit - 1

Maze - 1

T-unit

This is a single independent predication (main clause) together with any subordinate clauses that may be grammatically related to it. It may be a single or a complex sentence, but not a compound sentence. Where there is a compound sentence the division is made before the connecting conjunction (and, but, etc.) and the next T-unit begins with the conjunction.

Further guidelines for segmenting T-units are:

1. When a quotation consists of more than one principal clause, only the first one is included with the words that identify the speaker.

   e.g. /One man said "Theres only one good one/I'll give you a quarter for it."/

2. Having a T-unit within a T-unit is possible.

   e.g. /and she looked at them (/I'll buy this set/) and paid him one dollar./

3. When the meaning of a passage indicates that a subordinate conjunction has been omitted, the clause involved does not form a new T-unit.

   e.g. /he could not see the ship because they had gone too far and (because) it was foggy/

4. "Yes," "O.K.," "No" are included in the succeeding T-unit if the following statement is an elaboration of the answer; otherwise, they are considered to be incomplete T-units.

   e.g. /No I don't want to sell/

   /no/ then in go your cowboy boots/

5. "So" when used conditionally is a subordinate conjunction but when used with the sense of "and so," it is a co-ordinate conjunction and begins a new T-unit.

   e.g. /He was finding golf balls so he could sell them/

   /But he sees one of the fishermen feeling very sick/ so the captain's son wants to take his place/so he gets on the boat with the other fisherman/

Incomplete T-unit

This consists of a group of words which do not form an independent clause but which are necessary to the ongoing flow of language. Since it does not form an independent clause, it is different from a T-unit. It may be lacking a subject, verb, object,

or complement or any combination of these.

The following four types of incomplete T-units were noted:

1. One or more words are inadvertantly omitted.

   e.g. /His next customers was two ladies/<u>one lady did not anything</u>/

   /it was the two boys/<u>so sneaked up and pulled the emergency brake on their car</u>/

2. A subordinate clause is constructed in isolation.

   e.g. /<u>When they find the right spot by dropping a lead bar with a rope hooked on to it and with some butter on the bottom</u>/

3. A direct quotation is made without reference to the speaker.

   e.g. /How many you got?/ <u>6</u> /

4. More specific words are provided for an antecedent.

   e.g. /then after that some of the men went out in a boat/(<u>two men</u>)/

<u>Maze</u>

This consists of a word or words which do not constitute a T-unit and are not necessary to the identification of a T-unit.

There were two kinds of mazes that occurred:

1. A <u>repeat</u> involving the inadvertent repetition of a word or words.

   e.g. (he)/he had a long stick with a sort of funnel on the end/

   /He then had (to go) to go to the captain of the ship/

2. An edit involving a word or words which precede a change in direction of what the person was about to write, or precede a better choice of words.

   e.g. /It was about a boy going (to) on a fishing boat/

APPENDIX B

DENOTATIONAL/RELATIONAL/SENTENTIAL/CONTEXTUAL/ SYNTACTIC INFORMATION

GENERAL DIRECTIONS FOR ANALYSIS

1. Classify each T-unit as Declarative, Interrogative, or Imperative.
2. Identify prepositions, conjunctions, expletives.
3. Identify nouns.
4. Identify verbs.
5. Analyse the nouns for SUBJECT, DIRECT OBJECT, INDIRECT OBJECT, COMPLEMENT relations.
6. Analyse each noun for denotational information.
7. Analyse each verb for denotational information.

DENOTATIONAL INFORMATION

Noun: This classification includes all nouns and pronouns (personal, demonstrative, relative, and interrogative).

e.g. The boy was happy he did that.
What are you selling?
It was about a boy who looked for golf balls.
The man saw this. (not "this man" which is considered a determiner).

Also included are compound nouns (emergency brake, golf balls, cowboy boots) and there as in: There was this boy.

Verb: This category includes complete verbs which are marked for tense and number and with the necessary modals and auxiliaries, but excludes verbs such as gerunds, infinitives, past participles and present participles when the latter two are used without an auxiliary.

e.g. It would have been better if they would have went home.
He was looking for bolf balls

Distinction between Verb + Preposition and Verb + Particle:

A verb + particle is of the form pick up as in "The man picked up his boots," or threw down in "They threw down some ropes," but not ran from in "He ran from the golf course."

Transitive: Two tests may be applied to determine if a particle is attached to the verb, rather than constituting a preposition. These tests are:

1. The particle may be moved as: "They threw some ropes down."
2. The sentence may be changed to the passive as: "His boots were picked up."

Neither of these tests can be applied in the case of a preposition:

"He ran the golf course from/The golf course was run from."

Intransitive: Three tests may be applied to the intransitive form:

1. The particle may not be moved as: "He grows up" is not acceptable as "Up he grows."

2. The particle may not be separated from the verb as in: "He turned suddenly up at the party." "Up" is a particle. Whereas "He fell slowly down the hill" is acceptable, so "down" is not a particle in this case.

3. The meaning of the verb + particle is different from that of the individual meanings of the two parts added together:

   "They took off (equals "departed") in their car." Whereas in "He fell down," the meaning is that of fell plus that of down, as shown by the question "Where did he fall?" The answer, "Down."

   If the expression in question shows one of the above three characteristics it may be labelled, verb + particle.

Information Attached to Nouns

Adjective: This is a descriptive word denoting quality, colour, etc. which is used with a noun or noun equivalent.

e.g. He had a long stick.
It got foggy.
He went up a hill with a big shady tree.
One of the men got sick.

Compound adjectives will be counted as one:

next-door neighbour
up-to-date dictionary
dark-haired boy

Adjective Phrase: This consists of a group of words which lack a subject and/or predicate. The most common type is introduced by a preposition.

e.g. The mate on the ship saw the boat.
He ran to the ship called the Jean Francis.
Feeling guilty, he dropped the golf balls.

Adjective Clause: This consists of a group of words containing a subject and predicate but is attached to a noun in a main clause for its interpretation.

e.g. He saw the lady who bought the three golf balls.
The boy went for lunch on top of a hill where you could see the whole tournament.

Negation: Words such as not, neither, which are contrary to a positive object or event. The negative element may also be attached to the adjective.

e.g. He gave them his golf balls but not all of them.
They heard no answer.

Intensifier: A word such as very, quite, certainly, really, extremely, so, real, too, which increases the degree of a modifier.

e.g. It was very foggy.
The boy was so happy.
The teenagers were too busy to look.

Determiner: A word that denotes a specific concept or class such as the, a/an, my, your, his, her, its, our, their, this, that, these, those.

e.g. The man could not find him.
He never came back to that golf course again.

Quantifier: A word that designates a certain number of a class. The quantifier has an adjective function as for example, all, any, some, certain, twenty-seven, several, more, less, none; and word groups like, a twelve-year-old, a lot of, a little, and a few, when they have an adjectival position.

e.g. They found the captain's thirteen-year-old boy.
He went to a pond to look for some more golf balls.
He woke up at four o'clock in the morning.

Information Attached to Verbs

Verbal: This includes infinitives and verb parts which are incomplete because they lack auxiliaries or modals, such as participles and gerunds.

e.g. He sold the balls to people coming to play golf.
Some of the fishermen went fishing.
The boy started to blow on a horn.
He stowed away on a boat called the Jean Francis.

Adverb: This is a descriptive word which may indicate time, place, manner, condition.

e.g. They drop his cowboy boots in the creek anyway.
He shut the door quietly.
He went running outside.
He saw a man almost falling down.

Adverb Phrase: This consists of a group of words which lack a subject and/or predicate. The most common type is introduced by a preposition.

e.g. He hid behind some bushes.
One day later, I undid their brakes.
You will have to work like all the other men.

Adverb Clause: This consists of a group of words containing a subject and predicate but is attached to a verb (or adverb) in the main clause for its interpretation.

Time: indicating when
When he had enough he would sell them.

Place: indicating where
He went down to the dock where the boats were.

Manner: indicating how
The boys started to run as fast as they could.

Condition: indicating circumstances
He felt happy because he had paid them back.

Negation: Words suggesting contrary to the positive: not, never.

e.g. The man never saw him.
He said, "No."
The boy tried to not listen to them.

Intensifier: A word such as very, extremely which increases the degree of an adverb.

e.g. Business wasn't going very well.
He ran home so quickly.

Modal: A word which indicates a meaning of obligation, or involves an inference - must, might, ought, can, could, may, shall, should, will, would, have (to), dare (to), have got (to), be going (to).

e.g. He would drop them into the pond.
She said, "May I see them?"
The men had to fix the turf.

Other Information

Expletive (Interjection): An expression of pain, surprise, anger, pleasure, or some other emotion: Oh! Ouch! Why! Also included are idiosyncratic expressions such as like, sort of, and everything.

e.g. One grunted and said, "Hey, kid!"
Well, the two men came and asked for a ball.

Preposition: A word used to show the relation between a noun or pronoun called its object and some other word in the sentence.

Single words: at, by, in, for, from, off, on, up, above, after, of, around, before, behind, between, below, during, except, over, through, to, under, until, without, with, about, against, among, beneath, beyond, despite, inside, into, outside, upon.

Group of words: in front of, by means of, on account of, in place of, because of, apart from, along with, except for, as far as.

e.g. He began to look for the golf balls in the stream.
He put out six balls in front of him.
He sat down beside a tree.

Connective: A word which connects words, phrases or clauses.

Examples: not so, and, for, but, or, nor, yet, both . . . and, not (only) . . . but (also), either . . . or, neither . . . nor, whether . . . or, if, although, though, that, because, since, so that, so . . . that, in order that, as, unless, before, than, where, when, as if, as soon as, once, and then, like, and so.

Adverbs used as conjunctions:

how, why, where, while, before, after, however, therefore, nevertheless, hence, accordingly, in case (that), in order that.

Also: accordingly, after all, and yet, as well as, at times, all the same, besides, but then, else, even, finally, first, moreover, on the other hand, in the first place, or else, still, meanwhile, later.

e.g. He kept down until they went.
The boy noticed that their car was parked on the hill.
To me it looked as if it was easy.
Give them to us free or else we will do it.

SENTENTIAL INFORMATION

This component consists of the three sentence types:

1. Declarative (which is a statement of information, intent, etc.)

   e.g. Someone was running after him.

2. Interrogative (which questions or seek information)

   e.g. Are your boots waterproof?

3. Imperative (which requests something to be done or commands)

   e.g. Go ahead!

RELATIONAL INFORMATION

Verb: This refers to a complete verb, that is, one marked for tense and number and with all the necessary modals and auxiliaries attached. It may occur in a main or subordinate clause.

e.g. The two men dropped his boot in the water.
That night, he thought of what he should have done.

Subject: This refers to the noun or pronoun immediately to the left of the verb.

e.g. The boys ran away.

Exceptions include:

"Thanks," said the boy.
Sell them to us! (No subject stated)

In such sentences as "There is only one good one" or "It started getting foggy" the existential element is counted as the subject.

Direct Object: This usually refers to the single noun or pronoun to the right of the verb (with no preposition intervening).

e.g. The men took him to the captain.

Exceptions include:

1. Questions where the direct object may precede the auxiliary "do."

   e.g. How many golf balls do you have?

2. Nouns following the verb "to be."

   e.g. The captain was his father.

3. Nouns following such words as "named, called."

   e.g. It was called the Jean Francis.

Complement: This refers to the noun which lies to the right of the verb "to be" or such verbs as "named, called."

e.g. In examples 2 and 3 above, father and Jean Francis are the complements.

Indirect Object: When two nouns occur to the right of the main verb (without an intervening preposition) this refers to the first of the two nouns. It may also occur after the preposition "to" or "for."

e.g. The boy sold the women the golf balls.
The boy sold the golf balls to the women.

But not:

They took Danny to his father.

because it is unacceptable to say,

They took his father Danny.

CONTEXTUAL INFORMATION

General Directions:

1. Identify the topics by underlining in red.

2. Indicate the order of the topic with respect to old/new information.

3. Underline Referential Connectives in blue.

4. Underline Logical Connectives in yellow.

Staging:

First, identify the topics/comments; second, indicate if they are new/old information; third, designate the order (actually the number of different topics/comments).

These guidelines may be used (for T-units only; ignore underlined and parenthesized material):

1. Identify the topic of each clause. This is the noun phrase to the left of each complete verb. The remainder is the comment.

2. Each clause (main and subordinate) has a topic/comment; that is, there may be more than one topic per T-unit

3. There is only one topic if the verb is compound; but two topics if there is a compound subject.

4. The topic of the first T-unit is of the First Order, since it is the first topic to be introduced.

5. Decide whether subsequent topics are "new" (never previously mentioned in the discourse) or "old" (previously mentioned) within the protocol. If new, assign it to one order below the previous topic. If old, assign to the same order as the topic with which it is coordinated.

6. A topic is old if it is in a coordinated relationship with an earlier topic/comment. Coordination may be determined by the presence of the referential information: pronoun, repetition, synonym (see following section on referential information).

7. A topic of an embedded clause to the right of the main clause is assigned to the same order of the topic/comment of its coordinate and is designated by an (a) with its coordinate number (e.g., 1a, 4a, 6a, etc.). If it is a new topic, it is given a number next in the sequence.

(1) (1a)
e.g. The boy was happy because he got revenge on the two guys.

(1)
He jumped into the bushes and just laid there until
(2)
the janitor was gone.

8. If the subordinate clause is to the left of the main clause, it is given the number of its coordinate topic or the number next in the sequence if it is a new topic. Then the topic of the main clause is treated as if it were in a subordinate clause to the right of the main clause.

(1) (1a)
e.g. If he wouldn't sell them, he would get his boots thrown in the water.

(1) (2)
If you won't sell us those golf balls, we'll drop your boots in the water.

9. In sentences beginning with There (There was Danny), It (when It is used in an existential manner, It is up to you*) the whole sentence is considered the topic (with no comment). The "content" of the topic is the noun or pronoun to the right of the verb.

10. If It is the first topic in the protocol and refers to the movie, it is designated as First Order.

Example:

(1) (2)
It was about a little boy, he was looking for golf balls.
(2) (2a)
After he found about four, he sold them in sets for one
(2)
dollar. One time when he was looking in a pond for some
(3) (3)
balls these boys came. The boys took his boots and threw them
(2)
in the water. The next day he ran to the golf course and
(4)
pulled the clutch out and their car went down the hill.
(5) (3)
Then a man came and they ran away.

Number of topics: 11
Number of orders: 5

Number of topics per order:	1st	2nd	3rd	4th	5th
	1	5	3	1	1

*Unless otherwise indicated by an asterisk, all sentence examples used in Appendix B were taken from the children's written language.

REFERENTIAL INFORMATION

The following guidelines are used to determine referential information.

*Pronoun: A pronoun is used to stand in for and refer back to a previous antecedent. The pronouns may be personal, relative, demonstrative, reflexive or possessive.

e.g. A man came along on his cart.
Then the boy bought a pop and drank it.
A golf cart or something like that.

Repetition: A lexical item itself is repeated and it is meant to refer to the same item previously introduced.

e.g. He pushed the car down to them. The park owners pulled the car out.

Synonym: One lexical item replaces another but is meant to refer to the same object or event. The substituted word is the same part of speech. One class of synonyms is words which might be listed in a dictionary as synonyms. Other words are synonyms only within the particular context, where they refer to the same thing.

e.g. ship - boat
women - ladies
a golf cart or something like that

Class-Inclusion: A noun phrase introduces a subset or a specific instance of a class mentioned previously, or names the class of a particular subset already introduced.

e.g. two guys - one guy
the crew on the ship - the mate
one sailor - all the sailors

Derivation: Two lexical items share the same semantic root and are usually the same part of speech.

e.g. They eat fish - *Fishing is hard
festival - festivities

---

*All referential pronouns are to be counted in this category. Consequently, all other categories (except Inclusion) will include nouns.

Inclusion: A general word or phrase is used to refer back to and sum up a preceding group of words (not a single word) which identify or describe an event or happening.

e.g. he was trying to get more golf balls. While he was doing this two teenage boys came.
Then he thought about what he did.

Formal Repetition: A lexical item is repeated, but it does not refer to the same object or event but instead introduces another member or subset of the class.

e.g. Danny starts to blow this horn and the big ship toots its horn.
Then they saw their ship and went back to it. Then Danny saw a big fishing ship.

LOGICAL INFORMATION

These guidelines are to be used to determine logical information.

Conditional: Applies to relationships between events where the second event follows from or must be preceded by the first event. This includes cases where the relationship may be causal.

e.g. 1. (They began to worry) because (for a moment they thought they were lost.)

2. (I'll throw them in the water) if (you don't sell.)

3. (They had found quite a good fishing spot) so (they stayed there for awhile.)

If so/and so begins a t-unit it is considered as conjunction; if it is within a t-unit, it is conditional.

Conjunction: Applies when two elements are simply joined together in equivalence.

e.g. (He went back to the golf course) and (the two men were there.)

Disjunction: Applies when one or another event occurs, but not both.

e.g. (The boys said to give them the golf balls) or (they would throw his boots in the water.)

Temporal Conjunction: Applies when an event happens at the same time as another event.

e.g. While (he was looking) (two men came.)

Temporal Disjunction: Applies when one event happens either before or after another event.

e.g. 1. After (he ate his lunch on a hill,) (he went looking for more golf balls.)

2. (He got scared) then (ran behind these bushes to hide.)

And then is taken together and indicates temporal disjunction.

Contrast: Applies when one element is set in contrast or opposition to another. If A not B. Uses connectives like but, although, nevertheless.

e.g. (Then all the other boats were coming in) but (not number eight.)

Comparison: Applies when two elements are compared along some dimension, attribute, or property—A more than, less than, or equal to B. Often the second verb is deleted.

e.g. 1. (Danny's father said he would have to work) like (the others.)

2. (The boy ran faster) than (the man.)

Spatial: Applies when the place where an event occurred is indicated.

e.g. (He pushed the car into the pond) where (the men were looking for golf balls.)

SYNTACTIC STRUCTURES

A syntactic structure may be one of three types:

1. T-unit which was the unit used for dividing the protocols into utterances.

2. basic T-unit which is the simplest independent predication which may be used to convey information.

3. alternate syntactic structure which with a basic T-unit make up a T-unit and which with the addition or substitution of words could become a basic T-unit. The alternate structures analysed are:

Relative Clause:

e.g. One of the men that was supposed to go on the boat got sick.

That + S as Object/Subject/Complement:

e.g. He dreams that he threw the bigger boys in the water.
*That he has made the team is obvious.
It turns out that he can.

WH + S as Object/Subject:

e.g. He went to the playground after and thought about what happened.
*What annoys me most is his arrogance.

Infinitive as Object:

e.g. The boy tried to not listen to them.

Infinitive of Purpose:

e.g. Jack gave the boy a horn to signal to the ship.

Ing-Nominative:

e.g. He had a dream about pushing one man in the water.

Ing-Nominative of Purpose:

e.g. He saw the teenagers in the swamp looking for some golf balls.

Adverbial Expansion of Manner + S:

e.g. It was so foggy they could not see the boat.

WH:

e.g. The other boys said they wanted them for a lower price.

WH + Auxiliary/Verb

e.g. He went to a big fishing boat called Jean Francis.
Then he heard a man running.
A man stood up with a rope around his neck.

(That) + S as Object:

e.g. He thought it was one of the boys.

(That) + S as Object Quotation (the quotation must contain a verb):

e.g. Then a man said, "How much are the golf balls?"
Two boys came along and said, "We'll give you fifty cents for a set."

Comparative 1:

e.g. If he wants to go fishing he has to do some work just like the other men are doing.

Comparative 2:

e.g. Maybe some day he would grow up to be just like his dad.

With Phrase:

e.g. He had a long stick with a sort of funnel on the end.

Adverbial Expansion - 1 in Place/Time/Manner/Cause:

e.g. They got out far where they wanted to go.
While he was doing this two teenage boys came.
To me it looked as if it were easy.
The teenagers threw the boy's shoes in the water yesterday so he let the car roll into the pond.

Adverbial Expansion - 2:

e.g. The boy was not found on the ship until the crew were at the table and one of the crewmen was in the kitchen.

Common Elements:

This refers to a structure which by itself is incomplete as a basic T-unit but could easily be expressed as such.

e.g. He was running through the grass and found a golf ball.
He went to a stream and got a pop and some lunch.

Adjective (only in front of the noun):

e.g. He went out to sea on a little boat.
He went up a hill with a big shady tree.

Participle (only in front of the noun, otherwise it is classed as a (WH Auxiliary/Verb):

e.g. They went back and did his fish-cleaning job.
Danny put them into a salted compartment down below.

Appositive:

e.g. Jack, the man in the boat, gave him a horn to blow.

Genitive:

e.g. The boy went to the two men's car.
The captain of the ship was his father.

Passive: This structure was not considered a syntactic alternate to the basic T-unit since it sometimes was the basic T-unit. Its presence was noted separately because of the implications for the focusing of the subject noun.

Scoring Sheet 1

T-Unit Information

Name _____ Circle Huntsman Stowaway

Age _____ Circle Speak Write

Sex _____

No. of T-units _____

No. of words in T-units _____

Average _____

Number of Mazes _____

Audible Pause _____

Holder _____

Edit _____

Repeat _____

Sentential Information

Declarative _____

Interrogative _____

Imperative _____

Relational Information

Subject _____

Direct Object _____

Indirect Object _____

Complement _____

Main Verb _____

Total _____

Denotational Information

Noun/Pronoun _____

Adjective _____

Adjective Phrase _____

Adjective Clause _____

Negative _____

Intensifier _____

Quantifier _____

Determiner _____

Total _____

Denotational

Verb _____

Verbal _____

Adverb _____

Adverb Phrase _____

Adverb Clause time _____

Adverb Clause place _____

Adverb Clause manner _____

Adverb Clause condition _____

Negative _____

Intensifier _____

Modal _____

Total _____

Prepositions _____

Connectives _____

Expletives _____

Total _____

Grand Total (all denot) _____

Scoring Sheet 2

Incomplete T-Unit Information

Name _____ Circle Huntsman Stowaway

Age _____ Circle Speak Write

Sex _____

Number of Incompletes _____

No. of words in incompletes _____

Average _____

Denotational Information

Noun _____

Adjective _____

Adjective Phrase _____

Adjective Clause _____

Negative _____

Intensifier _____

Quantifier _____

Determiner _____

Total _____

Denotational

Verb _____

Verbal _____

Adverb _____

Adverb Phrase _____

Adverb Clause time _____

Adverb Clause place _____

Adverb Clause manner _____

Adverb Clause condition _____

Negative _____

Intensifier _____

Modal _____

Total _____

Prepositions _____

Connectives _____

Expletives _____

Total _____

Grand Total (all denot) _____

Scoring Sheet 3

Alternate Syntactic Structures

Name _____ Age _____

Relative Clause _____

That + S Object/Subject/Complement _____

WH + S Object/Subject _____

Infinitive Object _____

Infinitive Purpose _____

Ing-Nominative _____

Ing-Nominative Purpose _____

Adverb Expansion of Manner + S _____

WH _____

WH + Auxiliary/Verb _____

(That) + S as Object _____

(That) + S as Obj. Quote _____

Comparative 1 _____

Comparative 2 _____

With Phrase _____

Adverbial Expansion-1 in Place/Time/Manner/Cause _____

Adverbial Expansion-2 _____

Common Elements _____

Adjective _____

Participle _____

Appositive _____

Genitive _____

Total _____

Passive _____

Scoring Sheet 4

Contextual Information

Name _____ Age _____

Referential Information

Pronoun _____

Repetition _____

Synonym _____

Class-inclusion _____

Derivation _____

Inclusion _____

Formal Repetition _____

Total _____

Logical Information

Condition _____

Conjunction _____

Disjunction _____

Temporal Conj. _____

Temporal Disj. _____

Contrast _____

Comparison _____

Spatial _____

Total _____

Grand Total _____

Staging

No. of topics _____

No. of different topics _____

First Order _____

Second Order _____

Third Order _____

Fourth Order _____

Fifth Order _____

Sixth Order _____

Seventh Order _____

Eighth Order _____

Ninth Order _____

Tenth Order _____

Eleventh Order _____

Twelfth Order _____

APPENDIX C

BALANCE WITHIN DESIGN FOR FILM SEEN AND LANGUAGE TASK PERFORMED*

*The same design was utilized in gathering data for the first study in the series (oral language) which made it necessary to alternate the language task performed (oral/written).

Age Group: Nine Year Olds (N = 36)

Film: Huntsman

Write First		Speak First	
Boys	Girls	Boys	Girls
N = 5	N = 4	N = 4	N = 5

Film: Stowaway

Write First		Speak First	
Boys	Girls	Boys	Girls
N = 4	N = 5	N = 5	N = 4

Age Group: Ten Year Olds (N = 36)

Film: Huntsman

Write First		Speak First	
Boys	Girls	Boys	Girls
N = 4	N = 5	N = 5	N = 4

Film: Stowaway

Write First		Speak First	
Boys	Girls	Boys	Girls
N = 5	N = 4	N = 4	N = 5

Age Group: Eleven Year Olds (N = 36)

Film: Huntsman

Write First		Speak First	
Boys	Girls	Boys	Girls
N = 5	N = 5	N = 4	N = 4

Film: Stowaway

Write First		Speak First	
Boys	Girls	Boys	Girls
N = 4	N = 4	N = 5	N = 5

APPENDIX D

LETTER TO PARENTS

_____ School

January 13, 1977

Dear Parent,

We are doing a university research project on how children's oral and written language develops during the ages nine to eleven. This study has been approved by the Edmonton Public School Board.

It would be most helpful to us, if _____ could take part in this study. The study will take place at _____ School during the latter part of January. It will take about one hour's time. The names of the children will not be used in the analysis of the results.

Should you require further information about the project, please contact the school. (_____) If, for any reason, you do not wish your child to take part in the project, please sign below and return.

Yours sincerely,

I do not wish _____ to be included in this project.

_____

(Parent's Signature